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MINERALS YEARBOOK

Area Reports: International 2005

Europe and Central Eurasia

Volume III

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MINERALS YEARBOOK

Area Reports: International 2005

Europe and Central Eurasia

Volume III

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U.S. DEPARTMENT OF THE INTERIOR
DIRK KEMPTHORNE, Secretary

U.S. GEOLOGICAL SURVEY
Mark D. Myers, Director

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Foreword

This edition of the U.S. Geological Survey (USGS) Minerals Yearbook discusses the performance of the worldwide minerals and materials industries during 2005 and provides background information to assist in interpreting that performance. Content of the individual Minerals Yearbook volumes follows:

- Volume I, Metals and Minerals, contains chapters about virtually all metallic and industrial mineral commodities important to the U.S. economy. Chapters on survey methods, summary statistics for domestic nonfuel minerals, and trends in mining and quarrying in the metals and industrial mineral industries in the United States are also included.
- Volume II, Area Reports: Domestic, contains a chapter on the mineral industry of each of the 50 States and Puerto Rico and the Administered Islands. This volume also has chapters on survey methods and summary statistics of domestic nonfuel minerals.
- Volume III, Area Reports: International, is published as four separate reports. These regional reports contain the latest available minerals data on more than 190 foreign countries and discuss the importance of minerals to the economies of these nations and the United States. Each report begins with an overview of the region's mineral industries during the year. It continues with individual country chapters that examine the mining, refining, processing, and use of minerals in each country of the region and how each country's mineral industry relates to U.S. industry. Most chapters include production tables and industry structure tables, information about Government policies and programs that affect the country's mineral industry, and an outlook section.

The USGS continually strives to improve the value of its publications to users. Constructive comments and suggestions by readers of the Minerals Yearbook are welcomed.

Mark D. Myers, Director

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Contacts

Information about the U.S. Geological Survey, its programs, staff, and products may be accessed on the World Wide Web at URL http://www.usgs.gov or by contacting the Earth Science Information Center at 1-888-ASK-USGS. For specific information about this publication, contact the Chief, International Minerals Section, Minerals Information Team, at (703) 648-7732, or the Team secretary at (703) 648-4961. Additional minerals information may be accessed on the World Wide Web at URL http://minerals.usgs.gov/minerals.

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Acknowledgments

The Country Specialists in the Minerals Information Team, U.S. Geological Survey, in preparing the International Review regional books of volume III of the Minerals Yearbook, extensively use statistics and data on mineral production, consumption, and trade provided by various foreign Government minerals and statistical agencies through various official publications. The cooperation and assistance of these organizations are gratefully acknowledged. Statistical and informational material was also obtained from reports of the U.S. Department of State, United Nations publications, and the domestic and foreign technical and trade press. Of particular assistance were reports submitted by the Resource Reporting Officers and other officers of the Department of State in U.S. Embassies worldwide. Their contributions are sincerely appreciated. Internal statistical support was provided by the staff of the Data Collection and Coordination Section of the Minerals Information Team.

The regimes of some countries reviewed in this volume may not be recognized by the U.S. Government. The information contained herein is technical and statistical in nature and is not to be construed as conflicting with or being contradictory of U.S. foreign policy.

John H. DeYoung, Jr.
Chief Scientist, Minerals Information Team

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The Mineral Industries of Europe and Central Eurasia

By Richard M. Levine, Walter G. Steblez, Steven T. Anderson, David R. Wilburn, Chin S. Kuo, Harold R. Newman, and Glenn J. Wallace

The area of Europe and Central Eurasia treated in this volume encompasses territory that extends from the Atlantic coast of Europe to the Pacific coast of the Russian Federation and includes the British Isles and Iceland. Greenland, which is located in the northwestern Atlantic Ocean, and the Sakhalin and the Kurile Islands, which are located off the Sea of Japan in the Pacific Ocean and which are political extensions of Denmark and the Russian Federation, respectively, are also treated in this volume.

Economic integration in Western Europe evolved into the formation of the European Union (EU), which is a supranational entity that at yearend 2005 comprised Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. [A very much diminished European Free Trade Area (EFTA), which comprised Iceland, Norway, and Switzerland, was the only non-EU entity in Western Europe.] The admission of new member countries has been one of the significant political programs of the EU. To gain membership, applying countries must fulfill political and economic requirements, such as achieve stability of the institutions that guarantee to uphold democracy, the rule of law, human rights, and respect for and protection of minorities; have a functioning market economy and the capacity to cope with competitive pressure and market forces within the EU; and be able to take on the obligations of EU membership, including adherence to the aims of political, economic, and monetary union.

In 2005, in the former centrally planned economy areas—that is, the countries of Central Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Poland, Serbia and Montenegro, Slovakia, and Slovenia) and the Baltic countries (Estonia, Latvia, and Lithuania)—had completed the transition from authoritarian Governments with central economic planning to open political systems with market-based economies. The transition among the countries of the Commonwealth of Independent States (CIS) (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan) was less complete; some of these countries had taken significant steps towards the establishment of open political systems and market-based economies, but others had made little progress.

The CIS was founded in 1991 by several Republics of the former Soviet Union (FSU) and later was extended to include all the former Soviet Republics except the Baltic states of Estonia, Latvia, and Lithuania. The CIS was established to provide a common economic space for the countries in the region. The CIS does not have supranational powers and all member countries have equal standing under international law. Although the member countries are pledged to economic integration, few actual measures have been taken to make the CIS a functioning integrated economic bloc similar to the EU and, in 2005, stresses had emerged within the CIS that were undermining its stated purpose. Turkmenistan discontinued permanent membership as of August 26, 2005, and became an associate member.

The European Commission (EC) continued negotiations in 2005 with Bulgaria and Romania (accession to the EU expected in 2007), with Croatia and Turkey (no date given for expected accession), and with other countries in the Balkans (in the preliminary stages of negotiation). The EU also promoted more democratic stability and economic development in such CIS countries as Ukraine through its European Neighborhood Policy (ENP) (Commission of the European Communities, 2006b, p. 2-5; 2006c).

The EU was enlarged by 10 new members (EU10) in 2004, which increased its population by more than 74 million to about 460 million (Poland alone accounted for more than 38 million more people). The population of the EU exceeded that of the United States by about 55% in 2005, and its total gross domestic product (GDP) based on purchasing power parity approximately equaled that of the United States (tables 1, 2).

A major function of the EU has been to remove barriers to trade in an attempt to create a single market and to develop a common set of economic policies. New and prospective EU members must adhere to the EU's environmental and commercial standards. No common policy was in place regarding the mineral extractive industries; however, the mineral industries of the EU10 countries plus Bulgaria and Romania (in 2007) were expected to increase both the employment and the production of the mineral industry of the EU. Mine production of metals was expected to attain the largest increase compared with EU levels of production in 2004; the production of industrial minerals and mineral fuels was also expected to play a greater role in the expanding EU economy.

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- Croatia—Statistical Information and Documentation Division;
- Czech Republic—Czech Geological Survey, Ministry of Industry and Trade;
- Denmark—Danmark og Gronlands Geologisk Undersogelse;
- Estonia—Geological Survey of Estonia;
- Finland—Statistics Finland;
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- Germany—Bundesanstalt fuer Geowissenschaften und Rohstoffe;
- Hungary—Magyar Köztársaság Gazdasági Ès Közlekedési Minisztérium Magyar Geológiai Szogálat (Hungarian Geological Survey);
- Iceland—Statistics Iceland;
- Ireland—Geological Survey of Ireland;
- Kazakhstan—Agency on Statistics;
- Kyrgyzstan—Ministry of Foreign Affairs;
- Lithuania—Statistics Lithuania;
- Luxembourg—Central Statistical Service;
- Poland—Central Statistical Office;
- Portugal—IGM-Division de Statistical Studies;
- Romania—National Institute of Statistics;
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- Ukraine—State Statistics Committee; and
- United Kingdom—British Geological Survey.

General Economic Conditions

Because of the very different paths of development taken by the countries of Western Europe (now the EU and the EFTA) compared with that of the countries of Central Eurasia (now the CIS) and other centrally planned economy countries of the region after World War II, an economic asymmetry between the two areas emerged that was particularly apparent in the mineral sector. This asymmetry framed the initial commercial relationship in the minerals sphere between the two areas following the dissolution of the Soviet Union, and it still persisted, though to a lesser degree, in 2005. The EU continued to import raw materials from, toll-smelt raw materials in, sell equipment and technology to, and invest in mineral development projects in the as yet unaffiliated countries of the Balkans and the CIS; these commercial activities, however, mostly were not reciprocated by many of the formerly centrally planned economy countries. In Russia, however, mineral enterprises were attempting to internationalize their holdings and some of Russia's leading companies, including ALROSA Company Limited, MMC Noril'sk Nickel, and RUSAL, were buying major foreign assets.

The countries of the EU and the CIS are substantial participants in the world mineral economy and occupy important roles as suppliers and consumers of all major mineral commodities. In 2005, the EU continued to be a major world processing and consuming region and its role in the world mineral industry continued to be one of processing and consuming rather than mining. Central Eurasia remained a major world supplier of mined and processed minerals, but its consumption of these commodities remained at a low level. The unaffiliated countries of the Balkans played a much lesser role in both the supply and the consumption of most mineral commodities.

As a major world mineral processing and consuming area, the EU remained a determinant of world demand for nearly all mineral commodities. With the near exhaustion of much of its mineral reserves and the decline in its role as a world mine producer of minerals, the EU continued to produce metals, which included aluminum, copper, lead, steel, and zinc, using largely imported raw materials and secondary materials; its mineral processing and manufacturing industries accounted for a significant share of the world production of semimanufactured and fabricated ferrous and nonferrous metals. Germany remained the EU's dominant smelter and refiner of most metals.

In 2005, the mineral industries in Western Europe were either maintaining a stable level of output or reducing it. A decrease in output in many mining and processing sectors was expected in the next decade as reserves are depleted and processing facilities and plants age and are neither renovated nor replaced. Despite the diminution of Western Europe's importance as a mining region, Western Europe is an important world financial center and the headquarters of such major global mining and mineral processing companies as Anglo American S.A., Rio Tinto plc, and BHP Billiton plc. Also, Western Europe plays a significant global role in the extraction and processing of certain industrial minerals and mineral fuels. Significant petroleum and natural gas resources have been developed in the North Sea, and the EU also has significant coal reserves. Germany remained an important mine producer of a number of industrial minerals and coal.

Some metals were mined in the EU (mainly iron ore and copper), but mine production of metals was not globally significant. The key issue with the mineral industry for EU countries was the need to secure supplies of metallic mineral raw materials (such as concentrates, ores, and scrap) for their metal refining and processing industries. The accession of Poland, in particular, increased the EU's capacity to mine coal and copper, lead-zinc ore, salt, and sulfur, and to produce steel; the metal processing sectors of the mineral industries of the EU, however, remained heavily dependent upon imports of mineral materials. The EU still mined and quarried such industrial minerals as feldspar, kaolin, marble, potash, salt, and sand, and remained among the world's leading producers of feldspar, kaolin, and natural stone. In 2005, the EU continued extensive exploration for metal deposits in Ireland and Scandinavia and on the Iberian Peninsula (Commission of the European Communities, 2006a, p. 14, 21-22, 52, 60, 76, 84, 88, 120; European Evaluation Consortium, 2006, p. 18, 47-48, 50-54, 59).

In 2005, major mineral producing countries in Central Eurasia, Africa, Asia, and Latin America remained major mineral supply sources for the EU. Natural gas and petroleum imports from Russia were particularly important. To this end, a common economic space with Russia was deemed to be very important, and a roadmap to achieve such a level of cooperation was agreed to in May 2005 at an EU-Russia summit in St. Petersburg. EU-Russia tariffs were already considered to be low, but differences in Russia's regulatory framework

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(industrial policy and regulations on industrial products) from that of the EU was viewed as a significant source of nontariff barriers to freer trade in industrial products, including minerals. In attempting to create a more common economic space for industry, Russian authorities appeared interested in focusing on certain industrial sectors that included metals and some mineral-based chemicals. The EU interest in cooperation on enterprise and industrial policy issues in Russia was to align environmental, technical, and other regulations; manage the impact of restructuring industry to be more market based; help establish a better institutional environment for competitive business activity and investment; and possibly extend to Russia the EU support network for the EU's small- and medium-sized enterprises, which accounted for the vast majority of EU mining companies. Satisfaction of most of these objectives was expected to enable Russia to become a member of the World Trade Organization (WTO) (Carvalho, 2005; European Commission, undated, p. 3-6, 11, 15, 17, 20, 35-36).

In 2005, the EU established trade agreements with Kazahkstan and Ukraine (via European Neighborhood) to make freer trade in steel products possible. Although negotiations with Russia for a similar agreement continued during the year, import restrictions (quotas) remained in place for Russian steel products through the end of 2005 (Carvalho, 2005; Commission of the European Communities, 2006c; European Commission, undated, p. 7-8, 10, 21-22).

In the CIS, Kazakhstan, Russia, and Ukraine were the main mineral producing countries. Russia, which occupied about 75% of the territory of the CIS, was by far the largest country in the CIS in terms of both population and territory and had the leading mineral producing sector. Azerbaijan, Kyrgyzstan, Uzbekistan, and several other CIS countries also were important producers and processors of minerals. In 2005, Russia ranked among the leading world producers or was a large producer of such mineral commodities as aluminum, asbestos, arsenic, bauxite, boron, cadmium, cement, coal, cobalt, copper, diamond, fluorspar, gold, iron ore, lime, lithium, magnesium compounds and metals, mica (scrap sheet and flake), natural gas, nickel, nitrogen, oil shale, palladium, peat, petroleum, phosphate, pig iron, potash, rhenium, silicon, sulfur, steel, tin, titanium sponge, tungsten, and vanadium.

Kazakhstan was a significant producer of such mineral products as arsenic, barite, beryllium metal, bismuth, cadmium, chromite, copper, ferroalloys, lead, titanium sponge, uranium, and zinc. Ukraine was a significant producer of such mineral products as ferroalloys, iron ore, manganese ore, pig iron, steel, and titanium raw materials. Other CIS countries were significant world producers of one or more mineral commodities, including Armenia (molybdenum), Azerbaijan (oil), Belarus (potash), Kyrgyzstan (antimony metal, gold, mercury ore and metal), Tajikistan (aluminum), Turkmenistan (natural gas), and Uzbekistan (gold, uranium), and all the CIS countries produced a range of other mineral commodities.

The three main mineral producing countries in the CIS (Kazakhstan, Russia, and Ukraine) experienced varying rates of economic growth in 2005. Aggregate growth in Russia was still strong in 2005 as growth received a boost from increases in oil and gas prices. In 2005, the current account surplus exceeded $84 billion, with exports heavily dominated by fuels and raw materials (World Bank, The, 2006b§[1]) In 2005, the minerals sector accounted for more than 70% of the value of Russia's exports and this percentage was continuing to increase. Mineral fuels were by far the leading category of exports in terms of value.

In 2005, growth slowed in the extractive and manufacturing sectors of Russia especially in the metallurgy and metal product sector. This downward trend appeared to reflect uncertainty about the business and regulatory environment—particularly for oil—and the significant increases in production costs owing to the real appreciation of the ruble and high factor prices. The slowdown heightened concerns within Russia about the appropriate policy measures needed to address resource dependency and promote more diversified growth (World Bank, The, 2006b§).

A number of economic studies have suggested that resource abundance is not necessarily an advantage in economic development. In recent years, economic development has taken place in a number of resource-poor countries, which include those of East Asia, while many relatively resource-rich countries in Latin America have performed less impressively. Besides being vulnerable to declines in commodity prices, the onset of the so-called "Dutch disease" is a potential disadvantage of resource abundance. Dutch disease could happen if large foreign inflows from resource exports exert upward pressure on the real exchange and undercut the international competitiveness in some areas of the manufacturing sector and possibly discourage risk-taking in the manufacturing sector. Attempts to improve the performance of the Russian economy were focusing increased attention on these potential problems. With the sharp rise in commodity prices, the ruble continued to appreciate in real terms, thereby increasing competitive pressures on the manufacturing and other tradable goods sectors of the economy (World Bank, The, 2005a§).

Nevertheless, a consensus does not exist among economists that resource abundance is a major liability for the diversified economic development of such a large country as Russia, particularly if the country maintains an appropriate economic policy and realizes key reforms. Resource abundance could be an advantage for some areas of manufacturing in Russia. Russia's advantages in natural gas production and distribution and its ample gas reserves could help manufacturing firms obtain cheaper gas and cheaper thermal electric power generation than they could obtain elsewhere because the domestic rate for Russian gas is less than one-half of current market prices in Europe or Asia and is significantly lower than in other CIS countries. Access to cheaper gas could offer Russian manufacturing firms a potentially strong comparative advantage in the medium and longer term (World Bank, The, 2005a§).

Russia appeared to have no clear strategy in place for developing its mineral resources. Rather, the country was extracting its fuel and nonfuel mineral reserves at a high rate,

[1]References that include a section mark (§) are found in the Internet References Cited section.

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which was expected to lead to the depletion of the majority of these reserves before the year 2020, if not much sooner.

With the goal of developing a resource development strategy, the Russian Government was in the process of developing a list of areas of the economy that would be closed to foreign-dominated ownership; this list included the development of large mineral deposits. A new subsoil law remained under discussion in 2005. The law currently in place did not impose any special restrictions on companies with foreign participation, with the exception of those dealing in diamond or radioactive materials, but this policy appeared likely to change to the disadvantage of foreign companies, especially those interested in investing in such large or strategic deposits as the Sukhoi Log gold deposits or the Udokan copper deposit.

The proposed new mining law under discussion would limit foreign participation to 49% for some commodities. This restriction would apply to deposits with reserves of more than 150 million metric tons (Mt) of oil, 75 billion cubic meters of gas, 10 Mt of copper, or 700 metric tons (t) of gold; to strategic raw materials, which include uranium, diamond, nickel, rare earths and high-purity quartz; and to mineral deposits located near defense or military facilities and frontier areas. Discussions were underway to lower the quantity of reserves even further from the above-specified quantities for restricted deposits.

Since 2000, Ukraine's economic growth had averaged almost 9% per year, reaching 9.4% in 2003 and 12.5% in 2004. In 2005, however, the gross domestic product (GDP) growth decelerated to 2.2% from January through November 2005 from 12.1% (the highest in Europe) for the same period in 2004. This slowdown was larger than would be expected from a cyclical downturn and revealed the need for Ukraine to diversify and modernize its economy to maintain growth rates. Ukraine's dramatic growth since 2000 had been fueled in part by improved terms of trade created by rising metal prices. In 2005, prices for metals exported by Ukraine were declining and prices for mineral imports, such as oil, were increasing (World Bank, The, 2005b§).

In 1992, Ukraine became a member of the International Monetary Fund and The World Bank. It is a member of the European Bank for Reconstruction and Development (EBRD) but not a member of the WTO. Ukraine applied for membership in the WTO in 1995 but by the end of 2005, accession to the WTO still had not been achieved.

Kazakhstan is the largest country, in area, in Central Asia and one of the most sparsely populated in the world. The country has considerable mineral resources and vast areas of arable land. Education is close to universal. The country has made significant progress in transforming its economy since the breakup of the Soviet Union. Following the 1998 regional financial crisis, the country's economic performance has significantly improved. Economic recovery and growth, which started in 2000 and continued through 2005, was led mainly by the oil sector. The real GDP grew by 9.6% in 2004 and by 9.4% in 2005 (World Bank, The, 2006a§).

The country's economy, which was heavily dependent on a few commodities, faces the challenge of diversification. Oil extraction and oil-related construction, transportation, and processing accounted for 16.6% of the GDP in 2005, and fuel and oil products made up 69% of the country's exports. Ferrous and nonferrous metals and grains were the only other significant exports. Exports of mineral commodities increased considerably in 2005, but the share of manufacturing in total exports declined in 2005 (World Bank, The, 2006a§).

Kazakhstan was able to manage the early phase of its oil windfall by saving part of the revenues in the National Fund of the Republic of Kazakhstan, which was established in 2000 to manage oil revenues. The Government has since focused on the optimal size of the National Fund. The Fund's balance was more than $5 billion, which contributed to macroeconomic stability. Kazakhstan was trying to improve its legal and regulatory frameworks and standards in an effort to join the WTO (World Bank, The, 2006a§).

Oil production was expected to continue to be the major activity driving the economy of Kazakhstan. Oil production was expected to double by 2010. Future economic prospects would depend on the Government continuing to manage increasingly large oil revenues so as to avoid excessive volatility in key macroparameters and avert the onset of Dutch disease. The Government appeared to understand the risks of heavy dependence on oil and was developing ways to achieve greater competitiveness and diversification of the economy with emphasis on basic infrastructure, competition, human capital, institutions, and the investment climate (World Bank, The, 2006a§).

In addition, Kazakhstan faced a number of environmental problems that were the result of past agricultural, industrial, military, and mining practices; the problems included industrial pollution, land degradation and desertification, and the challenge of dealing with the heritage of nuclear testing in the Semipalatinsk area. The World Bank was supporting the implementation of four ecological projects that had been created to address the management of drylands, the preservation of the northern part of the Aral Sea, the cleaning up of the pollution of riverine and underground water, and the environmental rehabilitation of an oilfield (World Bank, The, 2006b§). Significant improvements had been made to the environmental situation in the Northern Aral Sea area, in part through the construction of the Northern Aral Sea dam and the establishment of regulations regarding the use of the Syrdarya River (World Bank, The, 2006a§).

Exploration

Based on data provided by Metals Economics Group (MEG), exploration budgets for Europe and Central Eurasia increased in 2005 to about $528 million from the 2004 estimate of about $340 million (Cox and Goulden, 2005§; Metals Economics Group, 2005§). This increase resulted from a significant increase in reported exploration activity in Russia, as well as continued exploration interest in the Carpathian Arc (including Eastern Europe and Western Turkey), Central Eurasia, and Scandinavia (particularly Finland and Sweden).

European mineral exploration focused on gold (67%), base metals (25%), and diamond (5%). Because of high metal prices, many former mining areas of Europe are being reevaluated with newer geophysical methods; areas rich in base-metal sulfides were being reevaluated for platinum-group metal (PGM) potential.

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Based on data collected for this summary, exploration activity in the CIS focused on gold (62%), copper (11%), and PGM (11%) and was greatest in Russia and Kazakhstan. Russian gold deposits typically possess larger amounts of metal than the world average but generally have lower grades and require special processing because of a greater frequency of hard refractory ore (Leskov, 2004). Detailed historical data on many sites collected under the Russian system are often available, but differences in resource nomenclature can make assessment by foreign companies difficult. In addition, accessibility and climate conditions can pose risk to deposit development.

Government Policies and Legislation

Recent legislation in Kazakhstan affecting mineral exploration included the State Priority Act, which was passed in December 2004 and gives the Government priority rights to buy any natural resource asset. This law also allows for requisition and nationalization, provided adequate compensation is paid (O'Connell, 2005§). The Russian President signed a decree in March declassifying information on reserves and production of PGM and diamond (Skillings Mining Review, 2005). This decree enacts changes to a law approved in 2003 and was expected to make it easier for foreign exploration companies to evaluate Russian PGM and diamond deposits for possible investment.

The first meeting of the European Network of Mining Regions took place in January 2005. The initiative seeks to strengthen the mining sector in Europe and raise public awareness of the importance of metal mining (Mining Journal, 2005).

Commodity Overview

This report includes commodity outlook tables. Estimates for production of major mineral commodities for 2007 and beyond have been based upon such factors as announced plans for increased production and new capacity construction and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the data are estimated or reported and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within indicated timeframes. Forward-looking information, which includes estimates of future exploration, mine development and production, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a U.S. Geological Survey (USGS) prediction of what will occur.

Metals

Bauxite and Alumina and Aluminum.—Western Europe was the main primary aluminum-producing region in Europe and Central Eurasia, and its output accounted for about 14% of the world's primary aluminum output. Western Europe also was the world's leading producer of secondary aluminum (about 54% of total world output). Central Eurasia's production of primary aluminum, which was close to that of Western Europe's in 2005, was projected to overtake production in Western Europe by 2007. Central Eurasia, however, was far behind that of Western Europe in the production of secondary aluminum. Central Eurasia was by far the area's leading producer of bauxite, although not on a scale of the world's leading producers.

Russia was the world's second ranked producer of aluminum after China. Russia's substantial aluminum smelting capacity was projected to increase steadily, thereby contributing to Central Eurasia's positive outlook for aluminum production. Russia also was planning to attain secondary aluminum production in a range of between 250,000 and 300,000 t/yr, although no specific date was given for achieving this goal.

In 2005, RUSAL was Russia's leading domestic aluminum producing company and, along with SUAL, which was the second ranked domestic aluminum producer and leading domestic bauxite producer, controlled all Russian aluminum, alumina, and bauxite production. Plans for RUSAL called for merging its resources with that of SUAL and with Swiss-based Glencore International AG to become United Company RUSAL. The planned merger could make the company the global leader in aluminum production.

RUSAL was investing to expand and modernize its production facilities. It was engaged in commissioning the Khakas Aluminum Smelter with a capacity of 300,000 t/yr. Plans for RUSAL also called for modernizing the Sayanogorsk aluminum smelter in 2006 to increase output of aluminum and alloys and to modernize the Nikolayev Alumina refinery in Ukraine to increase output to 1.6 million metric tons per year (Mt/yr) of alumina. RUSAL also planned to continue to expand production capacity at the Achinsk alumina refinery, increasing its output to 1.1 Mt/yr of alumina. The company's investment project portfolio included the Komi Aluminum project, which was initiated by SUAL. The project would include the development, construction, and operation of a bauxite-alumina complex in the Komi Republic based on the Middle Timan bauxite deposit. The design capacity of the complex was 6 Mt/yr of bauxite and 1.4 Mt/yr of alumina. The completion of this project would considerably reduce the Russian aluminum industry's dependency on foreign countries for raw material supplies.

Copper.—In 2005, Central Europe (mainly Poland) and Central Eurasia (Kazakhstan and Russia) were the chief areas of mine production. Although Western Europe was only a minor mine producer of copper, it produced a significant share of total world output of primary and secondary refined copper. Germany was the leading producer of refined copper in Western Europe and second in the region following Russia. Spain, and Sweden, in that order, followed Belgium as Western Europe's next top ranked refined copper producers in 2005.

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Central Eurasia followed Western Europe as a producer of refined copper, and Central Europe produced less than one-half the amount of refined copper as Central Eurasia. Russia remained the major producer of refined copper in Central Eurasia. Kazakhstan was also a major producer but had less than one-half the production of Russia. In Central Europe, Poland remained the main producer of refined copper, with output about 34% above that of Kazakhstan, but significantly below that of Russia.

Development and expansion of mine production of copper in Europe and Central Eurasia, in conjunction with reported ongoing and planned mine closures, could result in a net increase of copper mine production in the region of about 400,000 t by 2011. Kazakhstan, Russia, and Serbia appeared to be the countries where most significant production growth was likely to take place in both mine output and refined copper production.

All copper ore in Poland was mined by Kombinat Gorniczo Hutniczy Miedzi (KGHM) Polska Miedz S.A. (KGHM S.A.), which was a major world copper mining, beneficiation, smelting, and refining complex in the Lubin area. KGHM S.A. accounted for about 3.5% of world mine copper production in 2005. The Rudna Mine was the leading copper ore producer with a mining capacity of about 11 Mt/yr. Poland's copper reserves were projected to be depleted by 2040 (Ney and Smakowski, 2004). Poland's future mine output of copper may depend not only on the country being able to access new and environmentally tenable domestic copper deposits but also on the country's ability to assure future supplies of copper ore and concentrate from additional investments in the Democratic Republic of the Congo [Congo (Kinshasa)], Peru (Rio Blanco copper project), and the Philippines.

In 2005, Poland and Russia ranked among the top 10 copper ore producing countries in the world (Edelstein, 2007). Russia's leading copper producing enterprise, MMC Noril'sk Nickel, produced almost 60% of Russia's copper in ore output. The remaining copper in ore came from ore mined in the Ural Mountains. Almost 30% of Russia's copper metal production was from secondary material. As nickel-rich ores at Noril'sk become depleted, Noril'sk planned to switch to mining larger quantities of ores, which would be primarily copper rich ores that have a higher copper content relative to their nickel content than the nickel rich ores but are lower in metal content for both metals. This change would increase copper output as Noril'sk tries to maintain its level of nickel production. However, Noril'sk's strategy up to 2010 appeared to be to maintain its production of nickel rich ores, which would delay any significant increase in copper production.

The leading copper producer in the Ural Mountains, the Ural Mining and Metallurgical Company (UMMC), was planning to develop its raw material base and increase its output of copper in concentrate from 72,000 t in 2003 to 105,000 t in 2010. Mine output in the Urals would also expand as mine development takes place at the Russian Copper Company Limited, which was the country's third ranked copper producer. Development of the large Udokan deposit in Chita oblast was still on hold.

Kazakhmys, which was the firm that controlled almost all copper mining and metal production in Kazakhstan, was engaged in a number of projects to ensure growth in the short term and to provide for production replacement in the longer term. The majority of these projects was expected to begin production in the near or medium term and would include both new mine development and expansion of development at existing mines. The new mines included the Artemovskoye, which was recently completed ahead of schedule with a capacity to produce 28,000 t/yr of copper and 98,000 t/yr of zinc; the Zhaman-Aybat, which was under construction and has reserves of 75.3 Mt of ore containing 1.069 Mt of copper; and the Aktogay, which was being evaluated for development of an open pit to produce a total 1.614 billion metric tons (Gt) of ore at an average grade of 0.36% copper, for a total of 5.810 Mt of copper. Expansion of existing mines was planned for the East Saryoba underground mine and the Akbasau, the Kosmurun, and the Taksura open pits.

Gold.—Central Eurasia remained the dominant gold producing area within Europe and Central Eurasia, and accounted for more than 90% of the region's total output of gold. Central Eurasia's output was projected to increase through 2011.

Russia, Uzbekistan, Kazakhstan, and Kyrgyzstan, in that order, were the leading gold producers in Central Eurasia. Russia was expected to continue to be the region's main gold producing area through 2011. Russia has large quantities of undeveloped reserves with which it could increase output.

In 2005, the Russian gold mining sector experienced a continuation of key trends that had been affecting the sector for the past 5 years. Mine production remained at about the same level as that of the past 4 years, the share of gold from lode deposits was increasing, the number of small gold mining companies was being reduced, major companies were playing an even larger role in gold output, and foreign gold companies were continuing to intensify their investment activities.

Russia was having a difficult time expanding gold production as reserves at existing enterprises were being depleted and gold mining companies were finding it difficult to obtain licenses to mine new deposits. Formerly, local Government entities could issue such licenses, but in 2005, the licenses could be obtained only through the Russian Ministry of Natural Resources in Moscow. Placers contained about 18% of reserves but they were being significantly depleted, and most existing placer mining operations were unlikely to survive beyond 2011. However, placers still contributed almost 50% of annual production. In 2005, no new gold deposits were put into production. Two gold operations (one in production and one in development) by Bema Gold Corp. underwent extensive drilling in 2005.

More than one-half of Russia's hard rock gold resources occur in the Maiskoye, the Natalkinskoe, the Nezhdaninskoe, the Olimpiada, and the Sukhoi Log deposits in the Russian Far East and Siberia. More than 66% of Russian gold production came from six eastern regions (Amur, Irkutsk, Khabarovsk, Krasnoyarsk, Magadan, and Sakha-Yakutia). During the past 4 years, foreign companies have controlled 15% to 18% of gold production, which is the largest share held for any commodity in the Russian mining industry. These foreign-held enterprises produced a total of 30 to 36 metric tons per year (t/yr) of gold. Projects being developed by these foreign firms could contribute significantly to the growth in Russian gold production in the

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next 5 years and could increase Russia's gold output to about 250 t/yr if the projects are all successfully developed. Significant byproduct gold production resulted from mining operations by the UMMC in the Ural Mountains and Noril'sk's operations in East Siberia on the Taimyr Peninsula.

Iron and Steel.—The level of steel production in the region was not expected to change appreciably through 2011. Anticipated growth in steel production in Central Eurasia was expected to offset production declines in Western Europe.

With respect to the steel industry in 2005, the EU was primarily concerned about the competitiveness and level of privatization of crude steel production capacities in the new member countries, as well as those in prospective member countries. In 2004 (the latest year for which data were available), the degree of privatization in the production of crude steel in Bulgaria, the Czech Republic, Hungary, Latvia, Romania, and the Slovak Republic was estimated by the EU to be 100%; Poland, 95%; and Turkey, 80%; in Croatia, this sector was estimated still to be 100% state-owned. Also, the EU set a productivity goal of 550 t/yr of crude steel per employee, which was the average productivity of the EU15 countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom), as a target to be attained by new and prospective members (Commission of the European Communities, 2006a, p. 6, 24-28; European Commission, undated§).

To approximate the EU's average level of productivity, closure goals for yearend 2006 were recommended for inefficient steelmaking capacities in Poland and the Czech Republic, which totaled 1.4 Mt/yr and 590,000 t/yr, respectively. However, by March 2006, Poland had shut down only 90,000 t/yr of capacity, and the Czech Republic apparently still had not shut down any crude steel production capacity. These and other new EU member countries were able to defend maintaining high levels of crude steel production capacity because of increased demand and greatly improved steel market conditions for steel producers (relative to when the closures had been recommended by the EU). The EU15 maintained that that productivity issues would provide sufficient grounds for requiring closure of less-efficient capacity if steel prices were to decline even slightly. In 2004 (the latest year for which data were available), the average crude steel productivity level in Turkey was estimated by the EU to be about 435 t/yr per employee; in the Czech Republic and Hungary, 400 t/yr; in Poland, 280 t/yr; in Latvia, 250 t/yr; in Bulgaria and the Slovak Republic, 235 t/yr; in Romania, 115 t/yr, and in Croatia, 100 t/yr (Commission of the European Communities, 2006a, p. 6-7, 9, 14, 24-28, 37; European Commission, undated§).

In 2005 in Western Europe, steel production totaled more than 166 Mt. Germany continued to be the leading producer of crude steel, producing more than 44 Mt, followed by Italy, France, Spain, the United Kingdom, and Belgium. In Central Europe, each steel producing country had an annual output of about 8 Mt or less. Poland was the leading steel producer followed by the Czech Republic, Romania, and Slovakia. Steel production in Central Eurasia totaled 114 Mt. Russia and Ukraine together accounted for more than 90% of Central Eurasia's steel output; Russia's output of almost 66 Mt was considerably larger than Ukraine's output of almost 39 Mt

In 2005, Russia was the world's fourth ranked steel producer after China, Japan, and the United States. From 1998 to 2005, Russian steel production increased by more than 50%. Between 1998 and 2005, investment in the steel sector greatly increased, which improved economic indicators for steel enterprises and enabled them to improve product quality. Nevertheless, the Russian steel sector was still in need of investment to improve its ability to compete and to expand production capacity. The process of investing in the modernization and expansion of Russian steelmaking capacity was continuing at steelmaking enterprises, which included Chelyabinsk, Kuznetsk, Magnitogorsk, Nizhniy Tagil, Novolipetsk, Oskol, Uralsk, Zapadno-Sibirskiy, and a number of other steel mills.

The trend in the Russian steel industry as in other mineral industries was to consolidate enterprises under the ownership of a few major firms. The country's leading steel holding company was Evraz Group S.A. (a Luxembourg registered steel company), which had holdings that included three of the leading steel mills in Russia: Nizhniy Tagil in the Urals region and Kuznetskiy and Zapadno-Sibirskiy in Siberia. Russia's third ranked steel producer, Severstal, was discussing a merger with Arcelor S.A. of Luxembourg, in part to thwart a takeover bid for Arcelor by Mittal Steel of India, which was the world's leading steel company and which was consolidating steel mills worldwide. Russian steelmakers saw the need to create a company of sufficient size and pricing power to compete with the Mittal steel conglomerate and large enough to expand beyond Russia.

Ukraine was Central Eurasia's second ranked steel producing country and was among the top 10 steel-producing countries in the world in 2005. Ukraine's metallurgical industry worked at a high rate of capacity utilization—pig iron production capacity was being utilized at 86.5% and steelmaking capacity, at 94.3%, which did not leave extensive room for growth unless new capacity is added.

Ukraine's steel industry, which experienced continuous growth from 1999 to 2004, had a decrease in production in 2005 owing to unfavorable market conditions referred to as the "China factor." Before 2005, high demand from China had been stimulating growth in Ukraine's steel industry. In 2005, however, China switched from being a net importer to a net exporter of steel, which not only closed the China market to Ukraine but also curtailed Ukraine's exports to other countries of Southeast Asia. To remain competitive on the world steel market, Ukraine would need to invest in state-of-the-art equipment to produce steel of the same quality and at the same cost as other leading world steel-producing countries.

In October, in the country's largest privatization deal, the Government of Ukraine sold 93% of the Krivoyrozh steel mill (the country's leading steel mill) to Mittal Steel for $4.8 billion. Mittal Steel had submitted the winning privatization bid for the steel mill.

Mittal Steel's chief executive officer for the Krivoyrozh mill stated that plans called for investing about $1.2 billion during the next 4 years to modernize the plant. He said that a goal was

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to increase steel output to 7.9 Mt in 2006 from 6.953 Mt in 2005 and to 10 Mt by 2010. The company planned to modernize three blast furnaces, construct a new converter shop to replace the Soviet-era open hearth technology, and increase the supply of ore by sharply increasing output from mines in the Krivoy Rog region that the company had acquired as part of the Krivoyrozh mill purchase.

Iron Ore.—Russia and Ukraine were the major iron ore producers in the region. As of January 1, 2002 (the latest year for which data were available), according to official Russian reserve calculations, Russia had 172 iron ore deposits with a reserve base that totaled 56.6 Gt with an average iron content of 35.87% and reserves that totaled about 25 Gt. Open pit production accounted for more than 90% of ore production. Despite recent increases in iron ore production, Russia will likely find it increasingly difficult to sustain such increases without significant investment because mining conditions for iron ore were becoming more difficult owing to the increasing depths of the open pits. Expansion of iron ore mining was planned in the Kursk Magnetic Anomaly (KMA); the expansion was expected to require large investment, however, because the ore lies under a thick layer of sedimentary rock that is saturated with water. Efforts were also underway to develop technology to mine deeper lying high-grade ore deposits in the KMA.

Ukraine has about 30 Gt of iron ore reserves. Two-thirds of the iron ore reserves are located in the Krivoy Rog basin, where practically all iron ore mining takes place. A large increase in production would require significant investment to develop underground mines to access additional reserves and to process large accumulations of iron-rich tailings. Nevertheless, Ukraine's reserve base was considered adequate to sustain production for another 50 to 80 years and was expected to play a key role in the development of Ukraine's ferrous metals sector.

Foreign investment in Ukraine's iron ore mining sector would result in increasing the country's iron ore output. Following the purchase of the Krivoyrozh steel mill in October, Mittal Steel planned to invest $243 million to increase iron ore output at mines it purchased along with the plant. Plans called for Mittal Steel to increase iron ore output at these mines from about 8 Mt of concentrate in 2005 to 13 Mt in 2009 and eventually to 16 Mt/yr.

In the Northern and the Southern Balkans, iron ore output continued on a small scale as producers developed more electric-arc-furnace steel production and replaced domestic iron ore production with imports from the CIS. Sweden remained the only significant source of iron ore in Western Europe.

Central Eurasia was expected to continue to be the region's main producer of iron ore through 2011, with a modest increase in production projected for this area owing mainly to expansion of mine output in Ukraine. In Central Europe, an increase in production was projected in Bosnia and Herzegovina. A slight increase in iron ore production was projected for Western Europe by 2011. Overall, about a 12% increase in iron ore output was projected for the entire region by 2011.

Lead and Zinc.—Western Europe, Central Europe, and Central Eurasia were relatively minor mine producers of lead. Europe and Central Eurasia continued to be an important producing region for primary and secondary refined lead. Although Western Europe was a significant producing region for primary refined lead, it produced an even larger share of the world's reported output of secondary refined lead. Data on recovery and use of secondary lead in Central Eurasia has remained incomplete, which makes it difficult to compare production levels for this commodity. In Central Eurasia, only Kazakhstan was a major producer of primary refined lead. Central Europe produced a small share of the world's output of primary and secondary lead.

Poland remained the leading mine producer of lead ore in the entire region followed by Ireland. In Western Europe, after Ireland, Sweden was the next ranking lead mining country, and in Central Eurasia, Kazakhstan followed by Russia were the significant mining countries for lead.

An overall 8% increase in mine production of lead appeared to be set for this region through 2011, with the largest increases in mine output projected for Greece, Kazakhstan, and Romania. The low quality of lead-zinc ores in Russia in terms of metal content in comparison with other parts of the world was expected to inhibit investment in the development of Russian lead-zinc mines. Reported plans for Europe and Central Eurasia until 2011 indicate an increase in the production of primary refined lead, with output buoyed by anticipated production increases in the Central Eurasian and Central European areas, especially in Kazakhstan and Russia.

Kazakhstan was the major lead and zinc producing country in the CIS and was also the leading producer of these metals in the Soviet era. The industry was controlled by the company Kazzinc JSC, which controlled most lead and zinc production except for lead output at the Yuzhpolimetal JSC firm and zinc output associated primarily with copper, which was controlled by Kazakhmys Plc. In Kazakhstan, the Yuzhpolimetal firm was completing construction of a new 15,000-t/yr lead refinery on the base of the old Shimkent lead plant.

Europe and Central Eurasia's mine output of zinc accounted for about 15% of world production but about 30% of the world's output of zinc metal. Western Europe was the region's leading producer of primary zinc metal followed by Central Eurasia and Central Europe. Practically all reported data on secondary zinc production came from Western Europe.

The outlook for the region's mine output of zinc appeared set to show some increase. In Russia, development of the Tarnerskoye copper-zinc deposit in the Ural Mountains was proceeding, with the project scheduled to reach full capacity to mine 800,000 t/yr of copper-zinc ore by 2005.

Kazzinc's development strategy called for it to enter into the ranks of the world's leading producers of lead and zinc. Almost all Kazakhstan's lead and zinc production was exported, which placed Kazakhstan among the world's leading lead and zinc exporting countries. Kazakhstan's lead and zinc producing enterprises were currently (2005) operating below capacity. The Shimkent lead plant, which was part of Yuzhpolimetal, was working far below capacity owing to a lack of raw material.

Kazzinc's plans called for the company to begin mining at the Shaymreden deposit in Kustanay oblast in 2006, which would enable Kazzinc to produce an additional 60,000 t/yr of zinc. In the fourth quarter of 2004, Kazzinc began production at the new Shubinskoye mining subsidiary, which would operate the Shubinskoye underground mine in the vicinity of Ridder.

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Reserves at the Shubinskoye deposit were estimated to be 1.5 Mt of lead-zinc and copper ores.

In 2004, Kazzinc was awarded the tender for exploration and development of the Dolinnoe and the Obruchevskoe deposits near the town of Ridder in eastern Kazakhstan with mining expected to start in 2011. Plans called for mining 600,000 t/yr of ore from both deposits, which would yield a projected 25,600 t/yr of zinc and 51,000 troy ounces per year (about 1.6 t/yr) of gold.

Zinc metal production in Central Eurasia was projected to increase mainly in Kazakhstan and Russia. Kazakhmys, which controlled all Kazakhstan's copper production, commissioned the 100,000-t/yr Balkhash zinc smelter in 2003. The new smelter was scheduled to produce 70,000 t of refined zinc in 2004 and 90,000 t in 2005.

Nickel.—Russia was the world's leading producer of nickel. The majority of Russia's output was obtained from mixed sulfide ores at Noril'sk's operations in East Siberia and, to a lesser degree, from its operations on the Kola Peninsula. Output also came from other producers of laterite ores in the Ural Mountains, and a significant but smaller quantity of mined nickel came from Kazakhstan from an extension of the Ural Mountains laterite deposits. In Western Europe, relatively small quantities of nickel were mined in Finland and Greece from laterite deposits. Russia and countries of Western Europe were major world producers of refined nickel.

Noril'sk's investment in its nickel operations in the period up to 2010 apparently would result in only modest increases in production but could avert a significant reduction in production that might otherwise take place because of decreasing ore grades. This assessment of only a modest production increase followed a series of earlier plans put forth by Noril'sk. In 2003, Noril'sk issued a development plan to 2015 that called for Noril'sk to maintain the total amount of ore mined on the Taymyr Peninsula close to the current level of 14 Mt/yr. In 2005, a newer plan called for Noril'sk to raise output on the Taymyr Peninsula from the current level of 14 Mt/yr to 18 Mt by 2009; a newer long-term projection also issued in 2005 raised planned output to 22 Mt/yr. With metal prices and demand at very high levels, the new higher projections were in accord with Noril'sk's marketing strategy. A number of obstacles have hindered Noril'sk from realizing these development plans and have resulted in an assessment that nickel production would not significantly increase through 2010.

Noril'sk's mixed sulfide ores comprise disseminated and nondisseminated varieties. The higher grades are found in the nondisseminated ores, which differentiate into nickel-rich and copper-rich ores. Owing to the depletion of nickel-rich ores at existing workings, Noril'sk was planning to switch to mining a greater proportion of copper-rich and disseminated ores rather than nickel-rich ores to maintain and increase mine output levels. Noril'sk also was developing new mines to replace depleted reserves of nickel-rich ore. The company's copper-rich ore reserves, which are abundant, have a much lower nickel content and somewhat lower copper content than the nickel-rich ores, and the disseminated ores are lower in all base metals content than the nondisseminated ores. The nondisseminated and disseminated ores, however, are not that dissimilar with respect to their PGM content.

Development projects to mine nickel-rich ore reserves were underway. The Skalisty Mine, which is located on the Taymyr Peninsula, was under development and was expected to achieve its design capacity of 1.2 Mt/yr of nickel-rich ore in 6 to 7 years. Skalisty was scheduled to produce 310,000 t of ore in 2004. The Gluboky Mine, which is also located on the Taymyr Peninsula, was scheduled to come onstream by 2013-14. The Gluboky and the Skalisty Mines were expected to produce a combined 2 Mt/yr of nickel-rich ore.

Bateman Metals, Mintek, and Oriel Resources plc were involved in creating a demonstration-scale project for smelting nickel laterite ores from the Shevchenko deposit in the Zhetigara region of Kustanai oblast in northern Kazakhstan. The deposit contained a resource of 46 Mt of ore at an average grade of 1.01% nickel. This project was part of an ongoing definitive feasibility study that was scheduled to be completed in the third quarter of 2005. A prefeasibility study was based on the project producing 140,000 t/yr of ferronickel at a grade of more than 22% nickel within 5 years of startup. Startup could be as soon as 2007.

Platinum-Group Metals.—Russia accounted for almost all mine output of PGMs in Europe and Central Eurasia. Small amounts of platinum and palladium also were mined by Finland, Norway, Poland, and Serbia and Montenegro. Russia and South Africa were the only two major producers of PGM in the world. Russia was the world's second ranked producer of PGM after South Africa in 2005. Russia's PGM output (in contrast to that of South Africa) was predominately palladium owing to a higher ratio of palladium to platinum in Russian ores than in South African ores.

Both metals have major applications in the industrial sector. Palladium and platinum and, to a lesser extent, rhodium are critical components of catalytic converters, which control automobile emissions, and platinum is the critical catalytic element in the Proton Exchange Membrane (PEM) fuel cell under development to power automobiles. PGM were expected to be in much greater demand as the world's automobile fleet increases and is equipped with catalytic converters. As legislation calling for stricter automobile emissions controls is enacted, greater loadings of PGM in catalytic converters will be required. Also, the need for sources of energy other than oil could result in the development of a hydrogen-based economy powered by fuel cells that use platinum as a catalyst.

Noril'sk mined more than 90% of Russia's PGM output from mixed sulfide ores at its deposits at its Polar Division in East Siberia. An estimated 7 t/yr of PGM (mostly platinum) was mined from placer deposits in the Russian Far East, Siberia, and the Ural Mountains. Noril'sk's long-term development strategy appeared oriented towards maximizing PGM production rather than nickel production as nickel-rich ores become depleted. Noril'sk's remaining resources were richer in PGM relative to nickel and copper than were the ores currently being mined, although these ores were lower in their absolute PGM content. Along with developing new ore sources, Noril'sk planned to continue to develop the capability to recover PGM from abundant pyrrhotite tailings that had accumulated from many years of mining. Russian production was expected to continue to account for almost all the region's output of PGM, and

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production increases would depend to a large extent on the prices of the metals hosted in the mixed sulfide ores of the Noril'sk complex.

Despite Noril'sk's development plan to significantly increase ore extraction first of nickel-rich ores and then of copper-rich ores, Noril'sk was proceeding more slowly than its stated plans would indicate and it appears that through 2010, Noril'sk will try to keep PGM output levels at about the 2005 level.

Industrial Minerals

Diamond.—Russia was the region's only diamond producer. In accordance with Russia's participation in the Kimberley Process, Russia has been releasing its diamond production and trade figures, which for decades in both the Soviet Union and Russia had been held as a state secret. The Kimberley Process is a joint government, international diamond industry, and civil society initiative to stem the flow of conflict diamond, which is rough diamond that is used to fund rebel movements and terrorist activity.

In 2005, ALROSA Company Limited accounted for 97% of Russian diamond production and about 25% of world rough gem diamond production. Its major mining operations were in the Sakha Yakutia Republic, but in 2005, it commenced production at the Lomonosov diamond deposit in the northern European part of the country in Arkhangelsk oblast.

On June 28, 2005, full-scale mining was initiated at the Lomonosov deposit with the commissioning of ore treatment plant No. 1. The plant was designed with the capacity to process about 1 Mt/yr of ore. Diamond from the deposit was gem quality, which accounted for the high appraisal value of the reserves at $12 billion. The diamond deposit's effective life was estimated to be about 50 years from the time the plant was put into operation.

ALROSA also planned to expand its underground mining and exploration operations in Sakha-Yakutia. According to the company's president, the 2005 program, which was based upon ALROSA's 10-year development guidelines, calls for the expansion of underground mine production as its first priority. In 2005, ALROSA was able to maintain its level of mine output through its program of gradually switching to underground mining to extract low-grade diamond ore reserves. To maintain stable operations, ALROSA must increase ore reserves by carrying out intensive prospecting for new diamond deposits. The company planned to significantly increase investment in exploration. A new Mirny Exploration Expedition was established to concentrate on exploration.

Mineral Fuels and Related Materials

Most of the countries in Western and Central Europe were net importers of energy. With the exception of North Sea hydrocarbon production, Western Europe's sources of energy were expected to continue to be based on imports from the Middle East and the CIS. Major increases in energy consumption in the near term were not anticipated.

In Central Europe, domestic production of brown coal and lignite for electric power generation would likely be maintained to reduce the need for imported natural gas and petroleum, which had been largely supplied by the CIS. Poland's hard coal industry was expected to continue to modernize and to play an important regional role in the energy sector. Lignite, which was the fuel mainly used to power thermal electric power stations, continued to be an important source of energy in Central Europe and the Balkans. In Central Eurasia, Russia and other CIS oil and gas producers were expected to continue to be among the major providers of hydrocarbons to the world market. The rate of increases of future deliveries of these commodities to the world market, along with the successful exploration and development of new deposits, in part would depend on the resolution of pipeline and transport issues for their delivery.

Coal.—The CIS was the major coal producing region in Europe and Central Eurasia. Coal was produced in a large number of CIS countries with, in order of production, Russia, Kazakhstan, and Ukraine as the major coal producers. In 2005, Poland remained Central Europe's leading producer of anthracite, bituminous coal, and lignite. Poland's hard coal industry was expected to continue to modernize and to continue to play an important regional role in the energy sector.

Russia's coal production in the past several years has been increasing as the Russian economy has been growing and domestic demand for coal increasing. The Energy Strategy for Russia for the Period up to 2020 foresees the need for coal production to increase to between 310 and 330 Mt by 2010 and to between 375 and 430 Mt by 2020 to meet expected domestic demand. As foreseen in the country's energy strategy program, coal production must increase by 10 to 15 Mt/yr between 2005 and 2010 and by a total of 105 Mt by the year 2020.

Although the creation of additional coal production capacity through upgrading and expansion of existing mines and development of new mines is possible based on reserves, doing so would require a level of investment in the coal sector, including investment in new technology, far in excess of the historic level of investment in the past 5 years and casts doubt on the feasibility of such expansion. At current rates of investment, coal production capacity by the year 2020 would be in the neighborhood of 375 Mt. The optimistic growth scenario depends to a large extent on an increase in foreign investment, particularly from Chinese, Japanese, and South Korean companies.

Ukraine has 34.1 Gt in proven coal reserves, which accounts for more than 60% of the FSU's total coal reserves. The decrease in coal extraction following the dissolution of the Soviet Union began to reverse in 1997 and, since then, coal production has increased. Goals were set to stabilize coal extraction at between 85 Mt/yr and 90 Mt/yr. Most of Ukraine's coal is extracted from deep underground mines in the Donets Basin (Donbas) in the eastern region of the country.

According to Kazakhstan's classification system for mineral reserves, total geologic coal resources were assessed to be between 150 Gt and 160 Gt, of which 62% is brown coal and the remainder, bituminous coal. Kazakhstan had plans to increase production of coal, of which almost all is subbituminous.

Natural Gas.—Central Eurasia (mainly Russia) produced a substantial share of the world's production of natural gas, which in 2005 amounted to 27% of the world total. Western Europe accounted for 11% of world output, and Central Europe,

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less than 1%. Russia remained the world's leading natural gas producer and exporter. In 2005, natural gas production in Russia amounted to 635.964 billion cubic meters, which was only a 0.3% increase compared with that of 2004.

Russia has the world's largest natural gas reserves, with 1,680 trillion cubic feet (about 48 trillion cubic meters), which is nearly twice the amount of reserves in the next ranked country, Iran. To maintain output, Russia would have to develop new fields. Most of these fields are located in remote regions that lack infrastructure and would require a high level of investment. Unlike the case with oil, proven gas reserves were adequate to provide for projected production in East Siberia.

Russia's energy strategy predicts natural gas production to range between 635 to 665 billion cubic meters in 2010 and between 680 and 730 billion cubic meters in 2020. Growth in Russia's natural gas sector has been slowed primarily by aging fields, state regulation, OAO Gazprom's monopolistic control over the industry, and insufficient export pipelines. Three major fields in Western Siberia—Medvezh'ye, Urengoy, and Yamburg—account for more than 70% of Gazprom's total natural gas production, but these fields are in decline. Although Gazprom projects increases in its natural gas output between 2008 and 2030, most of Russia's natural gas production growth is expected to come from independent gas companies, such as Itera, Northgaz, and Novatek.

Russia has been reassessing its energy strategy since the strategy was issued in 2003. A Gazprom subsidiary issued a report recommending a change of export strategy for the Russian gas industry. It determined that Russia should decrease exports of natural gas to European markets and concentrate instead on developing new gasfields to keep up with domestic demand, which was rising faster than was envisioned in the 2003 report and could necessitate the development of new gasfields on the Yamal Peninsula and other places.

If Gazprom were to fulfill its long-term goal of increasing its European sales, it would have to boost its production and secure more reliable export routes to the region. Several proposed new export pipelines would serve European markets. Pipeline routes under consideration also would deliver gas to Asian markets.

Kazakhstan and Turkmenistan, which are large regional producers of natural gas, could be major factors in the region's expected rise in output. Kazakhstan's proven natural gas reserves were reportedly 65 trillion to 70 trillion cubic feet (about 1.8 trillion to 2 trillion cubic meters), which was comparable to Canada and Kuwait and ranked it among the leading 20 countries in the world.

According to the 15-year strategy of the Kazakhstan Ministry for Energy and Mineral Resources, the country plans to increase its natural gas production to 1.66 trillion cubic feet (about 47 billion cubic meters) by 2010, and to 1.84 trillion cubic feet (about 52 billion cubic meters) by 2015. About 25% of proven reserves are located in the Karachaganak oil and gas condensate field, which has proven natural gas reserves of between 16 trillion and 20 trillion cubic feet (between 371 and 566 billion cubic meters). A consortium that was developing Karachaganak expected peak production by 2010 to be about 1 trillion cubic feet (about 28 billion cubic meters). Another important natural gas field, Amangeldy, is situated in the south of the country near Zhambul. Exploratory drilling in 2001 indicated reserves of up to 1.8 trillion cubic feet (about 51 billion cubic meters). The field was being developed primarily by Kazmunaigas, and the company expected initial production of roughly 35 billion cubic feet per year (about 991 million cubic meters per year) after initial development.

Turkmenistan was one of the leading countries in the world in the quantity of its natural gas reserves. All gas pipelines that connect Turkmenistan to world markets had been owned by the Russian company Gazprom and routed through Russia. In the 1990s, Turkmenistan was denied access through this pipeline network to world markets; as a result, the country's incentive to produce natural gas was greatly reduced. In 2005, Turkmenistan was negotiating gas supply agreements with Russia and Ukraine, which would increase Turkmenistan's gas exports to these countries. Turkmenistan would not supply Ukraine directly; rather, it would supply the company RosUkrEnergo, which, in a deal reached with Russia in January 2006, would act as an intermediary in providing gas to Ukraine.

An agreement signed with Russia in September 2006 indicated that Turkmenistan would increase exports of natural gas from about 6 billion cubic meters in 2005 to about 50 billion cubic meters in 2007 and then to about 80 billion cubic meters in 2009, where it would remain until 2028. A portion of this gas sent to Russia would go to Ukraine.

The limited capacity of the existing natural gas pipelines and lack of alternative natural gas export routes has constrained Turkmenistan's natural gas export potential and made exports vulnerable to disruptions. A Trans-Afghan pipeline (TAP) was under consideration to export Central Asian natural gas via Afghanistan to Pakistan. The majority of this gas would come from Turkmenistan's Dauletabad field, which, according to authorities in Turkmenistan, holds more than 60 trillion cubic feet (almost 1.7 trillion cubic meters) of reserves. If verified, these reserves would make this field the fourth largest in the world. The TAP proposal was on hold, but then in 2005, with prospects for a more stable situation in Afghanistan, the idea for the TAP was revived.

In the spring of 2006, Turkmenistan's President signed an agreement with China to build an export pipeline to the east to export Turkmenistan's gas. According to the agreement, in the first phase of the project, which would start in 2008, Turkmenistan would deliver about 30 billion cubic meters per year of gas via Uzbekistan and Kazakhstan to Urumci in western China and beyond to Shanghai, and then would increase these volumes to up to 50 billion cubic meters per year by 2010. Experts have cast doubt on the project's feasibility for a number of reasons including a lack of details about the financing and construction. Turkmenistan's various export commitments appeared to far exceed its current (2005) production, and it is not clear that additional production could be commissioned in time to meet these commitments.

Although in 2005 Azerbaijan was a net natural gas importer, the country was expected to become a significant gas exporter with the development of the Shah Deniz natural gas field, which is considered to be one of the world's largest natural gas field discoveries in the past 20 years. According to BP p.l.c., the project operator, Shah Deniz has potential recoverable

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reserves of about 15 trillion cubic feet (almost 425 billion cubic meters) of natural gas and 600 million barrels (almost 82 Mt) of condensate. Using different and varying criteria for defining reserves, other industry and trade sources have estimated the field's size to be as high as 35 trillion cubic feet (about 990 billion cubic meters). The field is being developed by the Shah Deniz consortium, whose members include BP, Statoil ASA of Norway, State Oil Co. of Azerbaijan (SOCAR), the Egyptian-Russian joint venture (JV) LukAgip, NICO International of Dubai, the Belgium-French firm Total S.A., and Türkiye Petrolleri A.O. of Turkey (TPAO). The first phase of the Shah Deniz field's development was expected to begin producing natural gas for export during late 2006. According to BP, the second phase of the Shah Deniz project would produce an additional 1 trillion cubic feet per year (almost 30 billion cubic meters per year) of natural gas by as early as 2015. Production of natural gas from Shah Deniz, as well as associated gas from Azeri Chirag Gunashli (AGC) and the Bakhar-2 project, was expected to make Azerbaijan self-sufficient in natural gas and to result in significant export revenues.

Although Azerbaijan lacks any infrastructure for the export of natural gas, efforts were underway to secure export routes and customers for gas deliveries beginning in 2006. The main conduit for Azerbaijan's natural gas exports would be the "South Caucasus Pipeline," also known as "Baku-T'bilisi-Erzurum," which would run parallel to the Baku-T'bilisi-Ceyhan oil pipeline for most of its route before connecting to the Turkish gas pipeline network near the town of Horasan in Turkey. Pipeline construction began in late 2004 and was scheduled for completion during the first quarter of 2007. The pipeline was expected to carry 233 billion cubic feet (almost 7 billion cubic meters) per year initially; this amount could be increased later to up to 700 billion cubic feet (almost 20 billion cubic meters) per year with the future addition of compressor stations. Although most of the natural gas would be exported to Turkey, some of the natural gas would be sent to Europe via a transit pipeline through Greece.

Petroleum.—Europe and Central Eurasia's oil production was centered mainly in Russia in West Siberia. Development of major new petroleum resources, however, was taking place offshore in the Caspian Sea by the littoral states in conjunction with major Western firms.

The countries of the Caspian Sea region were of great importance to world energy markets because of the large oil and gas reserves in this region that were being developed. Proven oil reserves for the entire Caspian Sea region (estimated to be between 18 billion and 35 billion barrels (or between about 2.5 Gt and 4.8 Gt) were comparable to those of the United States (22 billion barrels, or about 3 Gt) and greater than those in the North Sea (17 billion barrels, or 2.3 Gt); estimated undiscovered oil resources could provide another 235 billion barrels (about 32 Gt) of oil.

For the past decade, Azerbaijan's offshore oil deposits in the Caspian Sea have been a major focus for global oil development. Since 1997, increases in the country's oil production have been produced mainly by an international consortium known as the Azerbaijan International Operating Company (AIOC), which accounts for more than 70% of Azerbaijan's total oil exports. AIOC, whose partners were BP; Devon Energy Corp., Exxon Mobil Corp. (ExxonMobil), and Unocal Corp. of the United States; Inpex Corp. and Itochu Corp, of Japan; SOCAR; Statoil ASA; TPAO; and a joint venture of Amerada Hess Corp. of the United States and Delta Oil Com. Ltd. of Saudi Arabia, operated the offshore Azeri, Chirag, and deepwater Gunashli (ACG) megastructure.

In the next decade, the main production development in Azerbaijan was expected to come from the three-phase development of the ACG megastructure. Total oil production from ACG was projected to reach approximately 500,000 barrels per day (bbl/d) by 2007 with the full implementation of Phase 1. If AIOC's Phase 2 plans are achieved, production from the East Azeri and West Azeri fields could add more than 800,000 bbl/d. Production was expected to peak at about 1 million barrels per day (Mbbl/d) by 2009 following the completion of Phase 3 (the final phase) and would include production from the deepwater Gunashli field.

Kazakhstan recently completed a new assessment of its oil reserves that put estimated proven and probable oil reserves at approximately 29 billion barrels compared with its earlier assessment in the 1990s of approximately 16 billion barrels. The country was poised to become an even more significant supplier to world oil markets in the next decade. Kazakhstan produced approximately 1.29 Mbbl/d of oil in 2005 and consumed 222,000 bbl/d, resulting in net exports of more than 1 Mbbl/d. Kazakhstan's Government planned to increase production levels to more than 3.5 Mbbl/d by 2015, mainly by producing about 1 Mbbl/d from the yet-to-be-developed offshore Kashagan field, 700,000 bbl/d from the onshore Tengiz field, 600,000 bbl/d from the yet-to-be-developed onshore Kurmangazy field, and 500,000 bbl/d from the onshore Karachaganak field. The remainder would come from the development of smaller fields.

Russia was the world's second ranked oil producer and oil exporting country after Saudi Arabia. The country's Energy Strategy of Russia for the Period up to 2020 that was issued in May 2003 revised oil production projections upwards and gas production projections downwards. The Energy Strategy for Russia for the Period up to 2020 includes several scenarios that predict a range for Russian oil output of between 445 Mt/yr and 490 Mt/yr by 2010 and between 450 Mt/yr and 520 Mt/yr by 2020.

Oil production and growth was to be centered in such traditional oil producing regions as West Siberia, the North Caucasus, and the Volga region and in new oil and gas provinces in the European North (Timan-Pechora region), in eastern Siberia and the Russian Far East, and in the south in the North Caspian region. Although the base of the country's oil production for this period of time will remain the West Siberian oil and gas province, priority areas for new development were to be in the eastern and southern regions of the country. New field developments would account for almost all Russia's annual oil growth in the next 5 years and would likely produce more than one-half of the country's oil in 2020. In the next 5 years, new field developments at the Middle Caspian project at Kurmangazy (Lukoil); the Komsomolskoye and the Vankorskoye projects (Rosneft); the Prirazlomnoye project (Rosneft and Gazprom); the Sakhalin Island projects;

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the West Salymskoye project (Shell Joint Venture); and the Timan Pechora project (Lukoil and ConocoPhillips) would help compensate for production decreases at older fields.

Uranium.—Europe and Central Eurasia were the major regional sources of mined uranium. Uranium mining took place mainly in the Central Asian countries.

Kazakhstan was the third ranked country in the world in the volume of uranium production. The company Kazatomprom (the state-owned company that controls the country's uranium industry) was the fourth ranked uranium producer in the world. Approximately one-fifth of the world's uranium reserves are located in Kazakhstan. Resources of uranium totaled more than 1.5 Mt, and more than 1.1 Mt could be mined by the in situ leaching (ISL) method. The head of Kazatomprom said the company aims to become the world's leading uranium producer by 2010; projections made by Kazatomprom call for uranium (U_3O_8) production in Kazakhstan to increase to 15,000 t/yr by 2010.

If these plans are realized, Kazatomprom could overtake Canada's Cameco Corp., which is the current (2005) world leader. Kazatomprom planned to invest $600 million in construction of new mines and development of existing ones to become the global leader. It intended to increase production by increasing output at existing mining operations and by developing new mining operations. Plans called for the development of mines at the Central Moinkum, the Eastern Mynkuduk, the Inkai, and the Kharasan deposits and joint venture development of the Irkol, the Moinkum, the Tortkuduk, the Zarechnoye, and the Zhalpak deposits, as well as construction of enrichment plants at the Shestoye, the Stepnoye, and the Tsentralnoye Mines. Plans also called for construction of a conversion plant to produce 3,000 t/yr of uranium hexafluoride for sale on the world market, and for the processing of uranium scrap into uranium dioxide and fuel pellets.

Uranium mining in Russia was conducted entirely by the corporation JSC TVEL's ore mining enterprises, and in particular by open pit mining at its subsidiary JSC Priargunsky Industrial Mining & Chemical Union and also by in situ underground leaching at its subsidiaries CJSC Dalur in the Kurgan region and JSC Khiagda in Buryatia. Annual uranium output was about 3,400 t (U content), and more than 90% of this amount was produced by Priargunsky. Uranium-bearing ores and solutions were processed to generate uranium concentrates, which were shipped for further reprocessing at the JSC Chepetsky Mechanical Plant.

Russia did not produce enough uranium to meet its consumption requirements and had to consume stockpiled material. The county was planning to make up for shortfalls by participating in uranium development projects at home and abroad. Russia planned to increase the capacity of its nuclear reactors by 50% by 2010 and by more than 450% by 2050. Russia's Ministry of Natural Resources drafted a program, Uranium of Russia, to explore for new uranium deposits to help meet Russia's expected uranium requirements of 17,000 t/yr in the next decade.

According to TVEL, Russia must more than double annual uranium production by 2020 to 7,500 t of uranium (U) from a current level of 3,400 t to meet growing demand and would have to increase uranium production to 12,000 t/yr by 2050. TVEL estimated that, given Russia's plans to expand nuclear power and export nuclear fuel, Russia's demand for uranium could more than triple from the current level of 9,000 t/yr to 29,000 t/yr by 2050. TVEL stated that mining could meet 52% of Russia's total demand for uranium; the use of secondary sources could supply 31% of demand; and imports, 17%. TVEL said that its estimates were based on the overall extent of reserves at known uranium fields. Russia could face a serious shortage of uranium after 2035. Putting new fields onstream could offset this expected shortage, but exploration would have to be stepped up in the mid-term for this to happen.

Ukraine was planning to raise its uranium extraction volumes to a level that would allow it to use its own nuclear fuel at all power stations by 2015. This plan is part of a draft strategy for developing Ukraine's fuel and energy complex until 2030. The investment necessary for such an increase in uranium extraction for the 2005-30 period was estimated to be $4.5 billion. Ukraine would need to attract private investment to develop the uranium industry.

Total uranium reserves in Uzbekistan reportedly are about 185,000 t, of which approximately 114,000 t could be developed by the ISL method. The country's uranium production had fallen by almost one-half since the Soviet period and the country was instituting a program to increase uranium output in the near future by investing in modernizing the Navoi mining and metallurgical complex, which was the country's main uranium producer. An upgrade of its facilities would enable Navoi to increase uranium output by 33%. Since 1992, all Uzbekistan's uranium production has been exported mainly to the United States through the U.S.-based intermediary Nukem, Inc.

References Cited

Carvalho, A.S., 2005, EU-Russia, consolidating neighbourly relations: Brussels, Belgium, The Directorate-General for Enterprise and Industry, European Commission, Enterprise Europe, no. 18, January-March, p. 20-22.

Commission of the European Communities, 2006a, Analysis of economic indicators of the EU metals industry—The impact of raw materials and energy supply on competitiveness: Brussels, Belgium, Commission staff working document, no. 1069, August 2, 126 p.

Commission of the European Communities, 2006b, Enlargement strategy and main challenges 2006–2007, including annexed special report on the EU's capacity to integrate new members: Brussels, Belgium, Communication from the Commission to the European Parliament and the Council, no. 649, August 11, 58 p.

Commission of the European Communities, 2006c, On strengthening the European Neighbourhood Policy: Brussels, Belgium, Communication from the Commission to the European Parliament and the Council, no. 726, December 4, 14 p.

Edelstein, D.L., 2007, Copper: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 52-53.

European Commission, [undated], Country strategy paper 2007-2013—Russian Federation: Brussels, Belgium, European Commission, 56 p.

European Evaluation Consortium, 2006, Evaluation of the 'Communication on promoting sustainable development in the EU non-energy extractive Industry'—Final report: Brussels, Belgium, Directorate-General for Enterprise and Industry, European Commission, March 6, 99 p.

Leskov, Mikhail, 2004, Project evaluation—A Russian viewpoint: Mining Journal, September 24, supplement, p. 21.

Mining Journal, 2005, European network launched: Mining Journal, February 18, p. 8.

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Ney, Roman, and Smakowski, Tadeusz, eds., 2004, Bilans Gospodarki Surowcami W Polce Na Tle Gospodarke Swiatowoj 1998-2003 [Minerals Yearbook of Poland 1998-2003]: Polish Academy of Sciences, Ministry of Environmental Protection, Natural Resources and Forestry, Krakow, December, 515 p.

Skillings Mining Review, 2005, Putin declassifies data on PGM and diamonds: Skillings Mining Review, April, p. 25.

Internet References Cited

Cox, David, and Goulden, Jason, 2005 (November), Worldwide exploration trends 2005, *in* China Mining 2005, accessed January 26, 2006, via URL http://www.china-mining.com/papers.shtml.

European Commission, [undated], Restructuring of the steel industry in the new member states—Candidate and third countries—Countries steel fiches, accessed August 9, 2006, via URL http://ec.europa.eu/enterprise/steel/countries_steel_fiches.htm.

Metals Economics Group, 2005 (November 10), Worldwide exploration budgets reach $5.1 billion in 2005—Just shy of 1997 peak, Press Release, accessed November 15, 2006, at URL http://www.metalseconomics.com/frame_press_releases.html.

O'Connell, Rhona, 2005, Opportunities in a changed country, Australian Corporate Exhibitions, accessed September 10, 2006, via URL http://www.minweb.net.

World Bank, The, 2005a, Moscow office economics unit, Russian Economic Report—March, accessed August 25, 2006, at URL http://ns.worldbank.org.ru/files/rer/RER_10_eng.pdf.

World Bank, The, 2005b, Ukraine's performance in 2005, accessed April 6, 2007, via URL http://www.worldbank.org.

World Bank, The, 2006a, Kazakhstan, Country Brief 2006, accessed April 6, 2007, via URL http://www.worldbank.org.

World Bank, The, 2006b, Russian Federation, Country Brief 2006, accessed April 16, 2007, via URL http://www.worldbank.org.

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TABLE 1
EUROPE AND CENTRAL EURASIA: AREA AND POPULATION (2005)[1]

Region and country	Area (square kilometers)	Population (thousands)
Western Europe:		
Austria	83,870	8,193
Belgium	30,528	10,379
Denmark	43,094	5,451
Finland	338,145	5,231
France	547,030	60,876
Germany	357,021	84,422
Greece	131,940	10,688
Iceland	103,000	299
Ireland	70,280	4,062
Italy	301,230	58,134
Luxembourg	2,586	474
Malta	316	400
Netherlands	41,526	16,491
Norway	323,802	4,611
Portugal	92,391	10,606
Spain	504,782	40,398
Sweden	449,964	9,017
Switzerland	41,290	7,524
United Kingdom	244,820	60,609
Total	3,707,615	397,865
Central Europe:		
Albania	28,748	3,582
Bosnia and Herzegovina	51,129	4,499
Bulgaria	110,910	7,385
Croatia	56,542	4,495
Czech Republic	78,866	10,235
Estonia	45,226	1,324
Hungary	93,030	9,982
Latvia	64,589	2,275
Lithuania	65,200	3,586
Macedonia	25,333	2,051
Poland	312,685	38,537
Romania	237,500	22,304
Serbia and Montenegro	102,387	10,829
Slovakia	48,845	5,439
Slovenia	20,273	2,010
Total	1,341,263	128,533
Central Eurasia:		
Armenia	29,800	2,976
Azerbaijan	86,600	7,962
Belarus	207,600	10,293
Georgia	69,700	4,661
Kazakhstan	2,717,300	15,233
Kyrgyzstan	198,500	5,214
Moldova	33,843	4,467
Russia	17,075,200	142,894
Tajikistan	143,100	7,321
Turkmenistan	488,100	5,043
Ukraine	603,700	46,711
Uzbekistan	447,400	27,307
Total	22,100,843	280,082
Regional total	27,149,721	806,480

[1]Source: Central Intelligence Agency, The World Factbook 2005

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TABLE 2
EUROPE AND CENTRAL EURASIA: GROSS DOMESTIC PRODUCT[1]

Region and country	Purchasing power parity		Annual percentage change (constant prices)
	Gross value (million dollars)	Per capita (dollars)	
Western Europe:			
Austria	262,295	32,059	2.4
Belgium	308,447	30,007	2.3
Denmark	179,797	33,252	2.5
Finland	152,097	29,095	2.6
France	1,745,946	28,145	2.3
Germany	2,408,867	29,204	1.8
Greece	225,077	20,387	3.0
Iceland	9,708	32,843	5.3
Ireland	154,050	37,894	5.0
Italy	1,653,289	28,670	1.9
Luxembourg	29,952	65,120	3.4
Malta	8,378	21,203	1.7
Netherlands	487,211	29,663	1.8
Norway	188,322	40,784	2.7
Portugal	197,713	19,340	2.2
Spain	989,427	23,911	2.9
Sweden	267,494	29,544	2.5
Switzerland	226,290	30,366	2.2
United Kingdom	1,739,572	28,877	2.5
Total	11,233,932	XX	XX
Central Europe:			
Albania	16,297	4,582	6.0
Bosnia and Herzegovina	27,572	7,035	4.0
Bulgaria	69,087	8,909	5.2
Croatia	53,064	11,792	4.1
Czech Republic	175,202	17,148	3.4
Estonia	19,603	14,284	5.4
Hungary	159,466	16,338	3.7
Latvia	26,266	11,197	6.0
Lithuania	44,400	12,837	7.0
Macedonia	15,353	7,438	4.5
Poland	473,813	12,452	5.1
Romania	176,502	7,957	5.0
Serbia and Montenegro	43,065	5,156	4.5
Slovakia	80,461	14,877	4.3
Slovenia	43,045	21,587	4.1
Total	1,423,196	XX	XX
Central Eurasia:			
Armenia	11,718	3,075	6.0
Azerbaijan	36,331	4,321	11.4
Belarus	62,040	7,202	5.5
Georgia	13,809	2,702	6.0
Kazakhstan	116,918	7,859	8.5
Kyrgyzstan	9,885	1,905	4.9
Moldova	7,860	2,163	4.0
Russia	1,456,964	10,301	6.6
Tajikistan	7,339	1,068	8.0
Turkmenistan	31,101	6,190	7.0
Ukraine	285,938	6,045	6.0
Uzbekistan	45,489	1,734	2.5
Total	2,085,392	XX	XX
Regional total	14,742,520	XX	XX

XX Not applicable.
[1]Source: International Monetary Fund, World Economic Outlook Database 2005.

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TABLE 3
SELECTED EXPLORATION ACTIVITY IN EUROPE AND CENTRAL EURASIA IN 2005

Country	Site	Commodity[1]	Company	Phase[2]	Type[3]
Armenia	Lichkvaz	Au, Ag, Cu	Iberian Resources Ltd.	Feasibility	Extension.
Do.	Zod	Au, Ag, Cu	Sterlite Gold Ltd.	Producer	Extension.
Bulgaria	Ada Tepe	Au, Ag	Dundee Precious Metals Corp.	Feasibility	Extension.
Do.	Krumovgrad	Au, Ag	do.	Feasibility	Extension.
Do.	Polski Gradets	Au	Cambridge Mineral Resources plc.	Exploration	New.
Do.	Rakitovo	Au, Ag	Euromax Resources Ltd.	Exploration	Continuing.
Do.	Tashlaka	Au	Cambridge Mineral Resources plc.	Exploration	New.
Finland	Arctic/Suhanko	PGM, Au	Gold Fields Ltd.	Feasibility	Extension.
Do.	Haarakumpu	Au, Cu	Belvedere Resources Ltd.	Exploration	New.
Do.	Hannukainen	Au, Cu	Northland Resources Inc.	Exploration	Continuing.
Do.	Haveri	Au	Northern Lion Gold Corp.	Exploration	Continuing.
Do.	Kaaresselka	Au	Tertiary Minerals plc.	Exploration	Continuing.
Do.	Kalkinnen	Cu, PGM, Au	do.	Exploration	New.
Do.	Keivitsa	Ni, Cu, PGM	Scandinavian Gold Ltd.	Exploration	Continuing.
Do.	Kuhmo	Ni, Cu	Vulcan Resources Ltd.	Exploration	New.
Do.	Kuusamo/Iso Rehvi	Au, Cu, Co	Belvedere Resources Ltd.	Exploration	Continuing.
Do.	Kylylahti	Cu, Co, Ni, Au	Vulcan Resources Ltd.	Exploration	Continuing.
Do.	Lahtojoki	Diamond	European Diamonds plc.	Exploration	Continuing.
Do.	Norra Barsele	Au	North American Gold Inc.	Exploration	New.
Do.	Peura-oho/Hietaharju	Ni	Vulcan Resources Ltd.	Exploration	New.
Do.	Rantasalmi/Osikonmäki	Au	Belvedere Resources Ltd.	Exploration	New.
Do.	Suurikuusikko	Au	Riddarhyttan Resources AB	Feasibility	Extension.
Do.	Unnamed	Au, Cu	Belvedere Resources Ltd.	Exploration	New.
Greece	Unnamed	Au, Cu	European Goldfields Ltd.	Exploration	New.
Greenland	Ammassalik	Ni, Cu, PGM, Au	Diamond Fields International Ltd.	Exploration	Continuing.
Do.	Black Angel	Zn, Pb, Ag	Black Angel Mining Ltd.	Exploration	New.
Do.	Garnet Lake	Diamond	New Millennium Resources Ltd.	Exploration	New.
Do.	Garnet Lake (Sarfartoq)	Diamond	Hudson Resources Inc.	Exploration	Continuing.
Do.	Malmbjerg	Mo	Galahad Gold plc.	Exploration	Continuing.
Do.	Nalunaq	Au	Crew Gold Corp.	Producer	Extension.
Do.	Skaergaard	Au, PGM	Galahad Gold plc.	Exploration	Continuing.
Do.	Spider Lake	Diamond	Hudson Resources Inc.	Exploration	New.
Do.	Storø	Au	Nuna Minerals A/S	Exploration	Continuing.
Do.	West Greenland	Diamond	Metalux Ventures Corp.	Exploration	Continuing.
Ireland	Curraghinalt	Au	Tournigan Gold Corp.	Exploration	Continuing.
Do.	Longford-Down	Au	Conroy Diamonds and Gold plc.	Exploration	Continuing.
Do.	North Limerick	Au	Alba Mineral Resources plc.	Exploration	Continuing.
Do.	Omagh	Au	Galantas Gold Corp.	Developing	Extension.
Do.	Pallas Green	Zn, Pb	Minco plc.	Exploration	Continuing.
Do.	Tivnacree	Au	Conroy Diamonds and Gold plc.	Exploration	New.
Do.	Tullybuck-Lisglassan	Au	do.	Exploration	Continuing.
Italy	Furtei	Au	Sargold Resources Corp.	Producer	Extension.
Kazakhstan	Baltemir	Au	Frontier Mining Ltd.	Exploration	New.
Do.	Beschoku	Cu	do.	Exploration	New.
Do.	Dostyk	Cu, Au	Eureka Mining plc.	Exploration	Continuing.
Do.	Koskuduk	Au	Frontier Mining Ltd.	Exploration	New.
Do.	Naimanjal	Au, Ag	do.	Developing	Extension.
Do.	Sekisovskoye/Tserkovka	Au, Ag	Hambledon Mining plc.	Feasibility	Extension.
Do.	Shevchenko	Ni	Oriel Resources plc.	Feasibility	Extension.
Do.	Shorskoye	Mo, Cu	Eureka Mining plc.	Producer	Extension.
Do.	Uzboy	Au	Alhambra Resources Ltd.	Feasibility	Extension.
Do.	Voskhod	Cr	Oriel Resources plc.	Feasibility	Extension.
Do.	Yubileiny	Cu	Frontier Mining Ltd.	Exploration	New.
Kyrgyzstan	Akbel-Cholotor	Au	Kentor Gold Ltd.	Exploration	New.
Do.	Aksur	Au	Palladex plc.	Exploration	Continuing.
Do.	Andash	Au, Cu	Aurum Mining plc.	Exploration	New.
Do.	Kumtor	Au	Centerra Gold Inc.	Producer	Extension.

See footnotes at end of table.

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TABLE 3--Continued
SELECTED EXPLORATION ACTIVITY IN EUROPE AND CENTRAL EURASIA IN 2005

Country	Site	Commodity[1]	Company	Phase[2]	Type[3]
Kyrgyzstan--Continued	Kuru Tegerek	Au, Cu	Eurasian Minerals Inc.	Exploration	Continuing.
Do.	Taldy Bulak	Au	Central Asia Gold Ltd.	Feasibility	Extension.
Do.	Tolubay	Au	Perseus Mining Ltd.	Exploration	Continuing.
Do.	Uzunbulak	Au	Kentor Gold Ltd.	Exploration	New.
Norway	Espedalen	Ni, Cu, Co	Blackstone Ventures Inc.	Exploration	Continuing.
Do.	Espedalen/Stormyra	Ni, Cu, Co	Noranda Inc.	Exploration	Continuing.
Do.	Falconbridge Joint Venture	Ni, Cu, Co	Blackstone Ventures Inc.	Exploration	New.
Do.	Gjedde Lake/Kobbfors	Au, Zn	Kenor ASA	Exploration	Continuing.
Do.	South Norway	Ni, Cu, Co	Blackstone Ventures Inc.	Exploration	New.
Do.	Vakkerlien	Ni, Cu, Co	do.	Exploration	Continuing.
Portugal	Jales/Gralheira	Au	St. Elias Mines Ltd.	Exploration	Continuing.
Do.	Lagoa Salgada	Cu, Pb, Zn, Ag, Au	Redcorp Ventures Ltd.	Exploration	New.
Do.	Montemor	Au	Iberian Resources Inc.	Exploration	Continuing.
Do.	Neves-Corvo/Zambujal	Cu, Pb, Zn, Ag, Au	EuroZinc Mining Corp.	Producer	Extension.
Romania	Bucium/Frasin/Rodu	Au, Ag	Gabriel Resources Inc.	Exploration	Continuing.
Do.	Cainel	Au, Ag	European Goldfields Ltd.	Exploration	New.
Do.	Carbunari-Stinapari	Au	Carpathian Gold Inc.	Exploration	New.
Do.	Certej	Au, Ag	European Goldfields Ltd.	Exploration	Continuing.
Do.	Hondol Carol	Au, Ag	do.	Exploration	New.
Do.	Magura Tebii	Au	do.	Exploration	New.
Do.	Oravita	Cu, Au	Carpathian Gold Inc.	Exploration	Continuing.
Do.	Pitigus	Au	European Goldfields Ltd.	Exploration	New.
Do.	Sacu	Cu	International Goldfields Ltd.	Exploration	New.
Russia	Chelyabinsk	Cu, Au, Mo	Eureka Mining plc.	Feasibility	Extension.
Do.	East Pansky	Pt, Pd	Bema Gold Corp.	Exploration	Continuing.
Do.	Haldelskaja	Au	Cigma Metals Corp.	Exploration	New.
Do.	Julietta	Au, Ag	Bema Gold Corp.	Producer	Extension.
Do.	Kolmozero-Voronya	Au, Ag	Ovoca Resources plc.	Exploration	Continuing.
Do.	Kupol	Au	Bema Gold Corp.	Developing	Extension.
Do.	Kytlim	Pt, Pd	Eurasia Mining plc.	Exploration	Continuing.
Do.	Mayskoye	Au	Highland Gold Mining Ltd.	Feasibility	Extension.
Do.	Monchetundra	Pt, Pd	Eurasia Mining plc.	Exploration	New.
Do.	Pioneer	Au	Peter Hambro Mining plc.	Feasibility	Extension.
Do.	Shevchenko	Ni	Oriel Resources plc.	Feasibility	Extension.
Do.	Svetloye	Au	Fortress Minerals Corp.	Exploration	New.
Do.	Taseevskoye	Au, Ag	Highland Gold Mining Ltd.	Exploration	New.
Do.	Tugojakovsk	Au	Cigma Metals Corp.	Exploration	New.
Do.	Veduga	Au	Peter Hambro Mining plc.	Feasibility	Extension.
Do.	Volchetundra	Pt, Pd	Eurasia Mining plc.	Exploration	New.
Do.	West Imandra	Pt, Pd	do.	Exploration	New.
Slovakia	Stiavnica-Hodrusa	Au	Eastern Mediterranean Resources plc.	Exploration	New.
Do.	Sturec	Au	Tournigan Gold Corp.	Exploration	Continuing.
Do.	Zlatniky	Au	Eastern Mediterranean Resources plc.	Exploration	New.
Spain	Aguablanca	Ni, Cu, PGM	Rio Narcea Gold Mines Ltd.	Producer	Extension.
Do.	Aguas Tenidas	Cu, Zn, Pb, Ag, Au	PGM Ventures Corp.	Feasibility	Extension.
Do.	Corcoesto	Au	Kinbauri Gold Corp.	Exploration	New.
Do.	Doade-Presqueira	Au	Solid Resources Ltd.	Exploration	New.
Do.	Golpejas	Rare earths	do.	Exploration	New.
Do.	La Zarza	Au, Cu	Ormonde Mining plc.	Exploration	Continuing.
Do.	Lomero-Poyatos	Au, Ag, Cu, Pb, Zn	Cambridge Mineral Resources plc.	Exploration	Continuing.
Do.	Navelgas	Au	Ventura Gold Corp.	Exploration	New.
Do.	Salamon	Au	Ormonde Mining plc.	Exploration	New.
Do.	Salave	Au	Rio Narcea Gold Mines Ltd.	Exploration	Continuing.

See footnotes at end of table.

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TABLE 3--Continued
SELECTED EXPLORATION ACTIVITY IN EUROPE AND CENTRAL EURASIA IN 2005

Country	Site	Commodity[1]	Company	Phase[2]	Type[3]
Sweden	Barsele	Au	Minmet plc.	Exploration	Continuing.
Do.	Cabra 1, 2	Ni, Cu, PGM	Lapp Plats plc.	Exploration	New.
Do.	Ersmarksberget	Au	Mawson Resources Ltd.	Feasibility	Extension.
Do.	Faboliden	Au	Lappland Goldminers AB	Feasibility	Extension.
Do.	Knaften	Au	do.	Exploration	New.
Do.	Kvarnberget	Zn, Ag, Pb	Boliden AB	Exploration	New.
Do.	Middagsberget	Au	Mawson Resources Ltd.	Exploration	New.
Do.	Nottrask	Ni, Cu	Tertiary Minerals plc.	Exploration	Continuing.
Do.	Oran	Au	Lappland Goldminers AB	Exploration	New.
Do.	Ormberget	Au	Mawson Resources Ltd.	Exploration	New.
Do.	Prantijarvi	Ni, Cu, PGM	Lapp Plats plc.	Exploration	New.
Do.	Sandvikstrask	Au	Lappland Goldminers AB	Exploration	New.
Do.	Stora Sahavaara	Fe	North American Gold Inc.	Exploration	New.
Do.	Stortjarnhobben	Au	Lappland Goldminers AB	Exploration	New.
Do.	Svartliden	Au	Mawson Resources Ltd.	Producer	Extension.
Do.	Tjaimtrask	Au	Lappland Goldminers AB	Exploration	New.
Do.	Vargbacken	Au	Mawson Resources Ltd.	Exploration	New.
Do.	Zinkgruvan	Zn, Pb, Ag	Lundin Mining Corp.	Producer	Extension.
Tajikistan	Pakrut	Au	Kryso Resources plc.	Exploration	Continuing.
Ukraine	Saulyak	Au	Eurogold Ltd.	Exploration	Continuing.
United Kingdom	Falkland Islands	Au	Falkland Gold and Minerals Ltd.	Exploration	New.
Do.	Arthrath, Scotland	Ni, Cu, PGM	Alba Mineral Resources plc.	Exploration	New.
Do.	Parys Mountain, Wales	Cu, Pb, Zn, Ag, Au	Angesey Mining plc.	Exploration	Continuing.
Uzbekistan	Amantaytau	Au	Oxus Gold plc.	Producer	Extension.
Do.	Khandiza	Ag	Marakand Minerals Ltd.	Feasibility	Extension.
Do.	Vysokovoltnoye	Ag, Au	Oxus Gold plc.	Producer	Extension.

[1]Abbreviations used for commodities in this table include the following: Ag, silver; Au, gold; Co, cobalt; Cr, chromium; Cu, copper; Fe, iron; Mo, molybdenum; Ni, nickel; Pb, lead; Pd, palladium; PGM, platinum-group metals; and Pt, platinum; Zn, zinc.

[2]Phase of exploration activity has been separated into the following stages: Developing, includes construction and permitting; Exploration, exploration prior to full feasibility study; Feasibility, feasibility study ongoing or completed; Producer, exploration at producing site.

[3]Type reflects relative timeframe of exploration activity, as follows: Continuing, exploration continued from previous year; Extension, extension of resource delineation; New, initial exploration by this company.

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TABLE 4
EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals													
	Aluminum								Antimony, mine output, metal content					
					Metal									
	Alumina		Bauxite		Primary[3]		Secondary				Chromite		Copper, mine	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity (metric tons)	Percent change[4]	Gross weight	Percent change[4]	Metal content	Percent change[4]
Central Eurasia:														
Armenia	--	--	--	--	--	--	--	--	--	--	--	--	16	-8%
Azerbaijan	315	36%	--	--	32	8%	--	--	--	--	--	--	--	--
Belarus	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Georgia	--	--	--	--	--	--	--	--	--	--	--	--	12	--
Kazakhstan	1,505	3%	4,800	2%	--	--	--	--	--	--	3,579	9%	402	-13%
Kyrgyzstan	--	--	--	--	--	--	--	--	10	-50%	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Russia	3,259	(5)	6,600	10%	3,647	2%	--	--	3,000	--	772	141%	700	4%
Tajikistan	--	--	--	--	380	6%	--	--	2,000	--	--	--	--	--
Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ukraine	1,632	4%	--	--	114	1%	130	--	--	--	--	--	--	--
Uzbekistan	--	--	--	--	--	--	3	--	--	--	--	--	100	5%
Total	6,710	3%	11,400	6%	4,170	2%	133	--	5,010	(5)	4,350	21%	1,230	-2%
Share of world total	11%	-2%	7%	-7%	13%	-4%	3%	-3%	4%	1%	23%	13%	8%	-4%
Central Europe:														
Albania	--	--	--	--	--	--	--	--	--	--	170	6%	2	164%
Bosnia and Herzegovina	350	-2%	900	-2%	131	8%	--	--	--	--	--	--	--	--
Bulgaria	--	--	--	--	--	--	2	--	--	--	--	--	80	--
Croatia	--	--	--	--	4	-20%	--	--	--	--	--	--	--	--
Czech Republic	--	--	--	--	--	--	15	--	--	--	--	--	--	--
Hungary	270	-10%	535	-17%	31	-10%	50	--	--	--	--	--	--	--
Macedonia	--	--	--	--	--	--	4	--	--	--	--	--	22	100%
Poland	--	--	--	--	43	-7%	12	--	--	--	--	--	526	--
Romania	689	23%	--	--	244	10%	7	9%	--	--	--	--	15	-27%
Serbia and Montenegro	250	2%	600	-2%	117	9%	--	--	--	--	--	--	26	9%
Slovakia	162	4%	--	--	158	-9%	--	--	--	--	--	--	(6)	--
Slovenia	--	--	--	--	139	15%	--	--	--	--	--	--	--	--
Total	1,720	6%	2,040	-6%	867	4%	90	1%	--	--	170	6%	670	3%
Share of world total	3%	1%	1%	-19%	3%	-1%	2%	-3%	--	--	1%	-1%	4%	1%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

Region and/or country	Metals													
	Aluminum								Antimony, mine output, metal content		Chromite		Copper, mine	
					Metal									
	Alumina		Bauxite		Primary[3]		Secondary		Quantity					
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	(metric tons)	Percent change[4]	Gross weight	Percent change[4]	Metal content	Percent change[4]
Western Europe:														
European Free Trade Association:														
Iceland	--	--	--	--	273	-4%	--	--	--	--	--	--	--	--
Norway	--	--	--	--	1,377	4%	362	4%	--	--	--	--	--	--
Switzerland	--	--	--	--	45	1%	--	--	--	--	--	--	--	--
Total	--	--	--	--	1,700	3%	362	4%	--	--	--	--	--	--
European Union (EU):														
Austria	--	--	--	--	--	--	151	-6%	--	--	--	--	--	--
Belgium	--	--	--	--	--	--	(6)	--	--	--	--	--	--	--
Denmark-Greenland	--	--	--	--	--	--	20	--	--	--	--	--	--	--
Finland	--	--	--	--	--	--	42	7%	--	--	571	-2%	16	1%
France	500	--	168	5%	442	-2%	222	-6%	500	--	--	--	--	--
Germany	1	-1%	--	--	648	-3%	704	--	--	--	--	--	--	--
Greece	782	-1%	2,441	2%	163	-2%	3	--	--	--	--	--	--	--
Ireland	1,500	7%	--	--	--	--	--	--	--	--	--	--	--	--
Italy	950	-3%	300	--	193	-1%	654	6%	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Netherlands	--	--	--	--	330	1%	50	--	--	--	--	--	--	--
Portugal	--	--	--	--	--	--	18	13%	--	--	--	--	89	-7%
Spain	1,000	--	--	--	422	6%	293	20%	--	--	--	--	5	238%
Sweden	--	--	--	--	103	1%	30	3%	--	--	--	--	98	8%
United Kingdom	--	--	--	--	368	2%	205	--	--	--	--	--	--	--
Total	4,730	2%	2,910	2%	2,670	(5)	2,390	3%	500	--	571	-2%	208	2%
Total Western Europe	4,730	2%	2,910	2%	4,360	1%	2,760	3%	500	--	571	-2%	208	2%
Share of world total	7%	-3%	2%	-11%	14%	-4%	54%	(5)	(5)	1%	3%	-8%	1%	(5)
Total Europe and Central Eurasia	13,200	3%	16,300	4%	9,400	2%	2,980	3%	5,510	(5)	5,090	17%	2,110	(5)
Share of world total	21%	-2%	10%	-10%	29%	-4%	59%	-1%	4%	1%	27%	10%	14%	-2%
United States[7]	5,220	-3%	NA	NA	2,480	-1%	--	--	--	--	--	--	1,140	-2%
Share of world total	8%	-7%	NA	NA	8%	-7%	--	--	--	--	--	--	8%	-4%
World total[7]	63,400	5%	172,000	15%	31,900	6%	5,060	3%	139,000	-1%	18,800	7%	15,000	2%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1,2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
							Iron and steel							
	Copper--Refined				Gold,		Iron ore,		Pig iron and				Lead, mine	
	Primary[3]		Secondary		mine output		mine output		direct-reduced iron		Steel, crude			
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity (kilograms)	Percent change[4]	Metal content	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Metal content	Percent change[4]
Central Eurasia:														
Armenia	--	--	--	--	1,400	-33%	--	--	--	--	--	--	--	--
Azerbaijan	--	--	--	--	--	--	4	-67%	--	--	59	173%	--	--
Belarus	--	--	--	--	--	--	--	--	--	--	2,076	8%	--	--
Estonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Georgia	--	--	--	--	2,000	--	--	--	--	--	--	--	(6)	--
Kazakhstan	419	-6%	--	--	18,062	-40%	9,300	-19%	3,581	-17%	4,452	-17%	44	33%
Kyrgyzstan	--	--	--	--	16,700	-24%	--	--	--	--	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--	--	550	-1%	--	--
Lithuania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--	--	1,000	-1%	--	--
Russia	664	(5)	269	5%	169,297	4%	56,100	(5)	51,759	-3%	66,186	1%	36	57%
Tajikistan	--	--	--	--	3,000	--	--	--	--	--	--	--	1	--
Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ukraine	--	--	--	--	--	--	37,700	5%	30,747	-1%	38,636	(5)	--	--
Uzbekistan	115	10%	--	--	90,000	-3%	--	--	--	--	607	--	--	--
Total	1,200	-1%	269	5%	300,000	-5%	103,000	-1%	86,100	-3%	114,000	(5)	81	42%
Share of world total	8%	-4%	14%	-3%	12%	-7%	12%	-11%	10%	-46%	10%	-6%	2%	34%
Central Europe:														
Albania	--	--	--	--	--	--	--	--	--	--	140	43%	--	--
Bosnia and Herzegovina	--	--	--	--	--	--	150	7%	60	--	283	142%	--	--
Bulgaria	61	15%	--	--	3,868	59%	--	-100%	1,400	--	2,400	--	32	28%
Croatia	--	--	--	--	--	--	--	--	--	--	69	-14%	--	--
Czech Republic	--	--	14	-7%	--	--	--	--	4,600	-15%	6,200	-12%	--	--
Hungary	10	--	--	--	--	--	--	--	1,329	-2%	1,962	(5)	--	--
Macedonia	--	--	--	--	750	100%	6	--	--	--	350	11%	--	--
Poland	560	2%	--	--	530	1%	--	--	4,677	-27%	8,336	-21%	116	33%
Romania	21	-15%	2	--	400	--	69	-7%	4,098	-3%	5,632	-7%	12	-37%
Serbia and Montenegro	23	94%	6	-14%	400	--	--	--	1,000	1%	1,286	10%	2	--
Slovakia	--	--	--	--	--	--	500	--	3,681	-3%	4,242	-7%	--	--
Slovenia	--	--	--	--	--	--	--	--	--	--	585	7%	--	--
Total	675	4%	22	-8%	5,950	56%	725	-3%	20,800	-12%	31,500	-10%	161	23%
Share of world total	5%	1%	1%	-15%	(5)	53%	(5)	-14%	2%	-25%	3%	-15%	5%	16%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
							Iron and steel							
	Copper--Refined				Gold,		Iron ore,		Pig iron and				Lead, mine	
	Primary[3]		Secondary		mine output		mine output		direct-reduced iron		Steel, crude			
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity (kilograms)	Percent change[4]	Metal content	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Metal content	Percent change[4]
Western Europe:														
European Free Trade Association:														
Iceland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Norway	39	8%	--	--	--	--	420	3%	90	--	690	-1%	--	--
Switzerland	--	--	--	--	--	--	--	--	100	--	1,200	--	--	--
Total	39	8%	--	--	--	--	420	3%	190	--	1,890	(5)	--	--
European Union (EU):														
Austria	--	--	72	-3%	--	--	655	9%	5,444	12%	7,031	8%	--	--
Belgium	400	4%	--	--	--	--	--	--	8,000	--	10,422	-11%	--	--
Denmark-Greenland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Finland	91	-31%	--	--	3,747	-40%	--	--	3,522	238%	4,738	-2%	--	--
France	--	--	--	--	100	-92%	--	--	12,700	-4%	19,500	-6%	--	--
Germany	240	-15%	399	8%	--	--	38	-34%	28,854	-4%	44,524	-4%	--	--
Greece	--	--	--	--	--	--	575	--	--	--	2,266	15%	--	--
Ireland	--	--	--	--	--	--	--	--	--	--	--	--	64	-3%
Italy	32	-4%	--	--	100	--	--	--	10,000	-6%	28,913	2%	1	--
Luxembourg	--	--	--	--	--	--	--	--	--	--	2,194	-18%	--	--
Malta	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Netherlands	--	--	--	--	--	--	--	--	5,000	--	6,919	1%	--	--
Portugal	--	--	--	--	--	--	10	--	100	--	725	1%	--	--
Spain	267	28%	35	--	5,500	5%	--	--	4,200	4%	17,800	1%	--	--
Sweden	200	-5%	22	-12%	4,400	-15%	15,300	4%	3,500	-3%	6,000	1%	59	8%
United Kingdom	--	--	--	--	--	--	(6)	--	10,500	--	13,210	-4%	1	--
Total	1,230	-2%	528	5%	13,800	-23%	16,600	4%	91,800	1%	164,000	-2%	124	2%
Total Western Europe	1,270	-1%	528	5%	13,800	-23%	17,000	4%	92,000	1%	166,000	-2%	124	2%
Share of world total	9%	-5%	28%	-3%	1%	-25%	2%	-7%	12%	-9%	15%	-8%	4%	-4%
Total Europe and Central Eurasia	31,400	(5)	819	4%	320,000	-5%	121,000	(5)	199,000	-2%	311,000	-2%	366	18%
Share of world total	21%	-3%	44%	-3%	13%	-7%	14%	-11%	32%	-9%	28%	-8%	11%	11%
United States[7]	12,100	-4%	47	-7%	261,000	1%	34,200	-1%	37,400	-12%	93,300	-6%	426	-1%
Share of world total	8%	-7%	3%	-14%	11%	-1%	4%	-12%	5%	-18%	8%	-12%	13%	-7%
World total[7]	14,700	3%	1,860	8%	2,470,000	2%	842,000	12%	840	11%	1,130,000	6%	3,360	6%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
	Lead--Refined				Manganese ore, mine output		Mercury, mine output, metal content		Nickel				Platinum-group metals, refined, primary and secondary	
	Primary[3]		Secondary						Mine		Refinery products		Palladium	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Metal content	Percent change[4]	Quantity (metric tons)	Percent change[4]	Metal content	Percent change[4]	Metal content	Percent change[4]	Quantity (kilograms)	Percent change[4]
Central Eurasia:														
Armenia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Azerbaijan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Belarus	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Georgia	--	--	--	--	73	15%	--	--	--	--	--	--	--	--
Kazakhstan	131	-16%	--	--	540	-5%	--	--	--	--	--	--	--	--
Kyrgyzstan	--	--	--	--	--	--	200	-59%	--	--	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Russia	66	-6%	--	--	23	--	50	--	320	2%	287	1%	97,400	(5)
Tajikistan	--	--	--	--	--	--	30	--	--	--	--	--	--	--
Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ukraine	--	--	6	-14%	770	-5%	--	--	2	--	14	17%	--	--
Uzbekistan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	197	-13%	6	-14%	1,410	-4%	280	-51%	322	2%	301	2%	97,400	(5)
Share of world total	5%	-19%	(5)	-17%	14%	-9%	20%	-28%	22%	-4%	22%	(5)	45%	-4%
Central Europe:														
Albania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bosnia and Herzegovina	(6)	(5)	--	--	1	--	--	--	--	--	--	--	--	--
Bulgaria	81	29%	--	--	11	43%	--	--	--	--	--	--	--	--
Croatia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Czech Republic	--	--	25	--	--	--	--	--	--	--	--	--	--	--
Hungary	--	--	--	--	5	--	--	--	--	--	--	--	--	--
Macedonia	--	--	--	--	--	--	--	--	--	--	8	53%	--	--
Poland	52	-7%	--	--	--	--	--	--	--	--	--	--	10	--
Romania	33	1%	5	--	14	-13%	--	--	--	--	--	--	--	--
Serbia and Montenegro	--	-100%	--	--	--	--	--	--	--	--	--	--	8	--
Slovakia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Slovenia	--	--	15	-4%	--	--	--	--	--	--	--	--	--	--
Total	166	9%	45	-1%	30	4%	--	--	--	--	8	53%	18	--
Share of world total	4%	2%	1%	-4%	(5)	(5)	--	--	--	--	1%	49%	(5)	--

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
	Lead--Refined				Manganese ore, mine output		Mercury, mine output, metal content		Nickel				Platinum-group metals, refined, primary and secondary	
	Primary[3]		Secondary						Mine		Refinery products		Palladium	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Metal content	Percent change[4]	Quantity (metric tons)	Percent change[4]	Metal content	Percent change[4]	Metal content	Percent change[4]	Quantity (kilograms)	Percent change[4]
Western Europe:														
European Free Trade Association:														
Iceland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Norway	--	--	--	--	--	--	--	--	--	--	85	19%	--	--
Switzerland	--	--	9	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	9	--	--	--	--	--	--	--	85	19%	--	--
European Union (EU):														
Austria	--	--	22	-8%	--	--	--	--	--	--	--	--	--	--
Belgium	--	--	60	-3%	--	--	--	--	--	--	--	--	--	--
Denmark-Greenland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Finland	--	--	--	--	--	--	15	-38%	3	--	35	-13%	--	--
France	--	--	106	(5)	--	--	--	--	--	--	11	-12%	--	--
Germany	119	3%	223	-8%	--	--	--	--	--	--	--	--	--	--
Greece	--	--	4	--	(6)	--	--	--	23	7%	17	-4%	--	--
Ireland	--	--	20	2%	--	--	--	--	--	--	--	--	--	--
Italy	50	24%	162	(5)	1	--	--	--	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Netherlands	--	--	22	--	--	--	--	--	--	--	--	--	--	--
Portugal	--	--	4	--	--	--	--	--	--	--	--	--	--	--
Spain	--	--	110	4%	--	--	--	-100%	5	-279%	--	--	--	--
Sweden	30	-1%	50	-4%	--	--	--	--	--	--	--	--	--	--
United Kingdom	126	-44%	120	140%	--	--	--	--	--	--	38	-2%	--	--
Total	324	-21%	902	6%	1	--	15	-95%	31	28%	101	-8%	--	--
Total Western Europe	324	-21%	911	6%	1	--	15	-95%	31	28%	186	3%	--	--
Share of world total	9%	-26%	26%	2%	(5)	--	1%	-92%	2%	21%	14%	1%	--	--
Total Europe and Central Eurasia	688	-13%	962	5%	1,440	-4%	295	-65%	353	3%	495	3%	97,400	(5)
Share of world total	18%	-19%	28%	2%	14%	-8%	21%	-49%	24%	-3%	36%	1%	45%	-4%
United States[7]	143	-4%	1,140	3%	--	--	NA	NA	--	--	--	--	133,000	-3%
Share of world total	4%	-10%	33%	-1%	--	--	NA	NA	--	--	--	--	6%	-6%
World total[7]	3,740	7%	3,500	3%	10,400	5%	1,420	-32%	1,500	6%	1,370	2%	217,000	4%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
	Platinum-group metals, refined, primary and secondary		Silver, mine output, metal content		Tin				Titanium, metric tons				Tungsten, mine output, metal content	
					Mine output, metal content		Metal, primary[3]							
	Platinum		Quantity		Quantity		Quantity		Ilmenite		Metal, sponge		Quantity	
Region and/or country	Quantity (kilograms)	Percent change[4]	(metric tons)	Percent change[4]	(metric tons)	Percent change[4]	(metric tons)	Percent change[4]	TiO_2 content	Percent change[4]	Metal content	Percent change[4]	(metric tons)	Percent change[4]
Central Eurasia:														
Armenia	--	--	4	--	--	--	--	--	--	--	--	--	--	--
Azerbaijan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Belarus	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Georgia	--	--	33	--	--	--	--	--	--	--	--	--	--	--
Kazakhstan	--	--	832	18%	--	--	--	--	--	--	19,000	15%	--	--
Kyrgyzstan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Russia	30,000	7%	1,350	6%	2,700	8%	4,700	3%	--	--	25,000	9%	5,300	-4%
Tajikistan	--	--	5	--	--	--	--	--	--	--	--	--	--	--
Turkmenistan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ukraine	--	--	--	--	--	--	--	--	226,000	--	8,397	12%	--	--
Uzbekistan	--	--	83	4%	--	--	--	--	--	--	--	--	--	--
Total	30,000	7%	2,310	10%	2,700	8%	4,700	3%	226,000	--	52,400	11%	5,300	-4%
Share of world total	9%	-1%	11%	5%	1%	7%	1%	-7%	5%	-2%	85%	-6%	7%	-5%
Central Europe:														
Albania	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bosnia and Herzegovina	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bulgaria	--	--	60	--	--	--	10	--	--	--	--	--	--	--
Croatia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Czech Republic	--	--	25	--	--	--	--	--	--	--	--	--	--	--
Hungary	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Macedonia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Poland	20	--	1,344	--	--	--	--	--	--	--	--	--	--	--
Romania	--	--	15	-17%	--	--	--	--	--	--	--	--	--	--
Serbia and Montenegro	1	--	2	--	--	--	--	--	--	--	--	--	--	--
Slovakia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Slovenia	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	21	--	1,450	(5)	--	--	10	--	--	--	--	--	--	--
Share of world total	(5)	--	7%	-4%	--	--	(5)	--	--	--	--	--	--	--

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued													
	Platinum-group metals, refined, primary and secondary		Silver, mine output, metal content		Tin				Titanium, metric tons				Tungsten, mine output, metal content	
					Mine output, metal content		Metal, primary[3]		Ilmenite		Metal, sponge			
	Platinum		Quantity		Quantity		Quantity						Quantity	
Region and/or country	Quantity (kilograms)	Percent change[4]	(metric tons)	Percent change[4]	(metric tons)	Percent change[4]	(metric tons)	Percent change[4]	TiO_2 content	Percent change[4]	Metal content	Percent change[4]	(metric tons)	Percent change[4]
Western Europe:														
European Free Trade Association:														
Iceland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Norway	--	--	--	--	--	--	--	--	388,000	(5)	--	--	--	--
Switzerland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	388,000	(5)	--	--	--	--
European Union (EU):														
Austria	--	--	--	--	--	--	--	--	--	--	--	--	1,350	-4%
Belgium	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Denmark-Greenland	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Finland	678	-4%	25	-34%	--	--	--	--	--	--	--	--	--	--
France	--	--	1	--	--	--	--	--	--	--	--	--	500	--
Germany	104,725	10%	--	--	--	--	4,912	-10%	--	--	--	--	--	--
Greece	--	--	78	--	--	--	--	--	--	--	--	--	--	--
Ireland	--	--	6	-5%	--	--	--	--	--	--	--	--	--	--
Italy	--	--	3	--	--	--	--	--	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Netherlands	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Portugal	--	--	24	-4%	228	14%	--	--	--	--	--	--	816	9%
Spain	--	--	2	-36%	--	-100%	--	--	--	--	--	--	--	--
Sweden	--	--	267	-9%	--	--	--	--	--	--	--	--	--	--
United Kingdom	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	105,000	10%	406	-9%	228	14%	49,100	-10%	--	--	--	--	2,670	1%
Total Western Europe	105,000	10%	406	-9%	228	14%	49,100	-10%	388,000	(5)	--	--	2,670	1%
Share of world total	33%	2%	2%	-13%	(5)	13%	1%	2118%	8%	-2%	--	--	4%	-1%
Total Europe and Central Eurasia	135,000	40%	4,160	4%	2,930	8%	9,620	256%	614,000	(5)	52,400	11%	7,970	-2%
Share of world total	42%	1%	20%	-1%	1%	8%	3%	-13%	13%	-2%	85%	-6%	11%	-4%
United States[7]	3,920	-3%	1,230	-2%	--	--	--	--	273,000	--	--	--	--	--
Share of world total	1%	-10%	6%	-6%	--	--	--	--	6%	-2%	--	--	--	--
World total[7]	319,000	8%	20,800	4%	303,179	1%	333,000	11%	4,590,000	2%	61,700	19%	71,300	2%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued				Industrial minerals							
	Zinc, metric tons											
	Mine, metal content		Metal, primary and secondary		Ammonia, N content		Cement, hydraulic		Diamond, natural, gemstones and industrial		Phosphate rock, P_2O_5 content	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]
Central Eurasia:												
Armenia	3,196	66%	--	--	--	--	605	21%	--	--	--	--
Azerbaijan	--	--	--	--	--	--	1,538	8%	--	--	--	--
Belarus	--	--	--	--	780	1%	3,131	15%	--	--	--	--
Estonia	--	--	--	--	170	2%	650	6%	--	--	--	--
Georgia	400	--	--	--	130	21%	450	6%	--	--	--	--
Kazakhstan	400,000	11%	356,907	13%	--	--	3,975	9%	--	--	52	-22%
Kyrgyzstan	--	--	--	--	--	--	975	22%	--	--	--	--
Latvia	--	--	--	--	--	--	280	-1%	--	--	--	--
Lithuania	--	--	--	--	432	2%	832	10%	--	--	--	--
Moldova	--	--	--	--	--	--	500	14%	--	--	--	--
Russia	200,000	12%	210,000	-13%	10,200	4%	48,700	7%	38,000	7%	4,500	2%
Tajikistan	--	--	--	--	9	-85%	253	31%	--	--	--	--
Turkmenistan	--	--	--	--	85	--	450	--	--	--	--	--
Ukraine	--	--	--	--	4,300	10%	12,183	15%	--	--	--	--
Uzbekistan	--	--	30,000	--	850	-3%	5,068	--	--	--	102	--
Total	604,000	11%	597,000	2%	17,000	5%	79,600	8%	38,000	7%	4,650	1%
Share of world total	6%	10%	6%	3%	14%	(5)	3%	1%	38%	-2%	10%	-4%
Central Europe:												
Albania	--	--	--	--	--	--	--	--	--	--	--	--
Bosnia and Herzegovina	--	--	--	--	1	--	1,000	-4%	--	--	--	--
Bulgaria	17,500	13%	95,100	-6%	320	--	2,100	--	--	--	--	--
Croatia	--	--	--	--	400	-1%	3,800	(5)	--	--	--	--
Czech Republic	--	--	250	--	250	--	3,978	7%	--	--	--	--
Hungary	--	--	--	--	275	(5)	3,349	-6%	--	--	--	--
Macedonia	--	--	--	--	--	--	800	-2%	--	--	--	--
Poland	117,200	-16%	155,000	18%	1,985	--	12,646	-1%	--	--	--	--
Romania	13,784	-42%	49,447	-6%	2,107	78%	7,032	13%	--	--	--	--
Serbia and Montenegro	3,000	50%	20,000	400%	60	--	2,200	-2%	--	--	--	--
Slovakia	--	--	--	--	295	7%	3,499	11%	--	--	--	--
Slovenia	--	--	--	--	--	--	1,300	--	--	--	--	--
Total	151,000	-16%	320,000	10%	5,690	20%	42,300	2%	--	--	--	--
Share of world total	2%	-17%	3%	12%	5%	14%	2%	-4%	--	--	--	--

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals--Continued				Industrial minerals							
	Zinc, metric tons											
	Mine, metal content		Metal, primary and secondary		Ammonia, N content		Cement, hydraulic		Diamond, natural, gemstones and industrial		Phosphate rock, P_2O_5 content	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]
Western Europe:												
European Free Trade Association:												
Iceland	--	--	--	--	--	--	132	32%	--	--	--	--
Norway	--	--	133,300	-5%	450	7%	1,900	2%	--	--	--	--
Switzerland	--	--	--	--	30	-6%	3,900	3%	--	--	--	--
Total	--	--	133,000	-5%	480	6%	5,930	3%	--	--	--	--
European Union (EU):												
Austria	--	--	--	--	(6)	(5)	4,736	19%	--	--	--	--
Belgium	--	--	300,000	-3%	860	(5)	8,000	--	--	--	--	--
Denmark-Greenland	--	--	--	--	2	--	2,070	1%	--	--	(6)	--
Finland	72,474	5%	281,905	-1%	59	-2%	1,321	-22%	--	--	--	--
France	--	--	210,000	-22%	1,200	7%	21,000	(5)	--	--	--	--
Germany	--	--	334,891	-12%	2,289	-16%	30,629	-4%	--	--	--	--
Greece	--	--	--	--	130	-1%	15,000	--	--	--	--	--
Ireland	428,596	-3%	--	--	300	--	2,500	--	--	--	--	--
Italy	--	--	121,000	3%	525	-1%	38,000	-5%	--	--	--	--
Luxembourg	--	--	--	--	--	--	700	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--	--	--	--
Netherlands	--	--	230,000	1%	2,000	2%	3,400	--	--	--	--	--
Portugal	--	--	3,000	--	244	--	10,000	--	--	--	--	--
Spain	--	--	501,400	-6%	400	-1%	50,347	10%	--	--	--	--
Sweden	214,600	9%	--	--	--	--	2,800	4%	--	--	--	--
United Kingdom	--	--	--	--	1,080	1%	11,500	2%	--	--	--	--
Total	716,000	1%	1,980,000	-7%	9,100	-4%	202,000	1%	--	--	(6)	--
Total Western Europe	716,000	1%	2,120,000	-7%	9,570	-3%	208,000	1%	--	--	(6)	--
Share of world total	7%	(5)	21%	-6%	8%	-8%	9%	-5%	--	--	(5)	--
Total Europe and Central Eurasia	1,470,000	3%	3,030,000	-3%	32,200	5%	330,000	3%	38,000	7%	4,650	1%
Share of world total	15%	1%	29%	-2%	26%	(5)	14%	-3%	38%	-2%	10%	-4%
United States[7]	748,000	1%	309,000	1%	8,040	-11%	101,000	2%	--	--	10,400	--
Share of world total	8%	(5)	3%	2%	7%	-15%	4%	-4%	--	--	22%	-5%
World total[7]	9,560,000	1%	10,300,000	-1%	123,000	5%	2,310,000	7%	196,000	9%	46,900	6%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Industrial minerals--Continued				Mineral fuels					
					Coal					
	Potash, K_2O equivalent		Salt		Anthracite		Bituminous		Lignite	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]
Central Eurasia:										
Armenia	--	--	35	10%	--	--	--	--	--	--
Azerbaijan	--	--	10	12%	--	--	--	--	--	--
Belarus	4,844	5%	1,839	-2%	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--	--
Georgia	--	--	--	--	--	--	8	--	--	--
Kazakhstan	--	--	--	--	--	--	83,480	-1%	2,905	-1%
Kyrgyzstan	--	--	1	--	--	--	809	631%	2,509	629%
Latvia	--	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--	--
Russia	7,129	11%	2,734	-2%	8,000	3%	215,000	6%	75,000	7%
Tajikistan	--	--	--	--	--	--	95	7%	--	--
Turkmenistan	--	--	215	--	--	--	--	--	--	--
Ukraine	65	30%	3,400	2%	17,000	-7%	58,000	-7%	3,000	--
Uzbekistan	--	--	--	--	--	--	71	--	2,629	--
Total	12,000	9%	8,230	-1%	25,000	-4%	357,000	2%	86,000	9%
Share of world total	36%	5%	3%	-7%	8%	-13%	8%	-2%	10%	6%
Central Europe and Balkans:										
Albania	--	--	25	1%	--	--	--	--	12	-5%
Bosnia and Herzegovina	--	--	250	-4%	--	--	--	--	9,000	1%
Bulgaria	--	--	1,900	--	--	--	96	-44%	24,813	-6%
Croatia	--	--	25	9%	--	--	--	--	--	--
Czech Republic	--	--	--	--	--	--	12,728	-13%	49,125	2%
Hungary	--	--	--	--	--	--	--	-100%	9,580	-13%
Macedonia	--	--	--	--	--	--	--	--	8,200	-4%
Poland	--	--	4,885	-5%	--	--	97,903	-3%	61,136	(5)
Romania	--	--	2,420	1%	--	--	--	-100%	31,122	-1%
Serbia and Montenegro	--	--	75	--	--	--	50	--	35,350	-1%
Slovakia	--	--	120	-1%	--	--	--	--	2,511	-15%
Slovenia	--	--	125	--	--	--	--	--	4,539	-6%
Total	--	--	9,830	-2%	--	--	111,000	-5%	235,000	-2%
Share of world total	--	--	4%	-8%	--	--	2%	-9%	26%	-4%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Industrial minerals--Continued				Mineral fuels					
					Coal					
	Potash, K_2O equivalent		Salt		Anthracite		Bituminous		Lignite	
Region and/or country	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]	Quantity	Percent change[4]
Western Europe:										
European Free Trade Association:										
Iceland	--	--	5	--	--	--	--	--	--	--
Norway	--	--	--	--	--	--	300	--	--	--
Switzerland	--	--	560	-2%	--	--	--	--	--	--
Total	--	--	565	-2%	--	--	300	--	--	--
European Union (EU):										
Austria	--	--	1,024	-1%	--	--	--	--	6	-97%
Belgium	--	--	--	--	--	--	--	--	--	--
Denmark-Greenland	--	--	610	--	--	--	--	--	--	--
Finland	--	--	--	--	--	--	--	--	--	--
France	--	--	6,730	-3%	8	-38%	92	-37%	--	--
Germany	3,664	1%	19,177	3%	2,416	-3%	23,282	-3%	177,907	-2%
Greece	--	--	198	6%	--	--	--	--	68,000	--
Ireland	--	--	--	--	--	--	--	--	--	--
Italy	--	--	3,600	--	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--	--
Malta	--	--	13	--	--	--	--	--	--	--
Netherlands	--	--	5,000	--	--	--	--	--	--	--
Portugal	--	--	598	-10%	--	--	--	--	--	--
Spain	575	-3%	3,950	-1%	3,889	5%	4,666	-11%	7,587	-7%
Sweden	--	--	--	--	--	--	--	--	--	--
United Kingdom	600	--	5,700	--	1,000	-17%	22,000	-6%	--	--
Total	4,840	(5)	46,600	(5)	7,310	-1%	50,000	-5%	254,000	-2%
Total Western Europe	4,840	(5)	47,200	(5)	7,310	-1%	50,300	-5%	254,000	-2%
Share of world total	15%	-3%	19%	-6%	2%	-10%	1%	-9%	28%	-4%
Total Europe and Central Eurasia	16,900	6%	65,200	(5)	32,300	-4%	519,000	(5)	575,000	(5)
Share of world total	51%	3%	26%	-6%	10%	-12%	11%	-5%	64%	-2%
United States[7]	1,300	--	46,500	--	1,550	(5)	949,000	2%	76,200	(5)
Share of world total	4%	-3%	19%	-6%	(5)	-9%	21%	-3%	9%	-2%
World total[7]	33,300	3%	249,000	6%	333,000	10%	4,510,000	5%	895,000	2%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

Region and/or country	Minerals fuels--Continued									
	Natural gas				Petroleum				Uranium, U_3O_8 content	
	Dry		Plant liquids		Crude		Refinery products			
	Quantity (million cubic meters)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (metric tons)	Percent change[4]
Central Eurasia:										
Armenia	--	--	--	--	--	--	--	--	--	--
Azerbaijan	5,732	15%	--	--	161,433	43%	56,194	16%	--	--
Belarus	228	-7%	--	--	13,102	-1%	145,347	7%	--	--
Estonia	--	--	--	--	--	--	--	--	--	--
Georgia	15	143%	--	--	490	-32%	294	7%	--	--
Kazakhstan	14,494	1%	--	--	406,500	9%	81,988	19%	5,138	17%
Kyrgyzstan	25	-14%	--	--	546	1%	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	1,590	-28%	62,526	11%	--	--
Moldova	--	--	--	--	--	--	--	--	--	--
Russia	635,964	(5)	166,805	(5)	3,500,000	6%	1,519,380	6%	4,045	7%
Tajikistan	29	-18%	--	--	159	14%	--	--	--	--
Turkmenistan	55,800	-5%	--	--	71,198	-3%	--	--	--	--
Ukraine	19	2%	--	--	31,400	2%	NA	NA	943	--
Uzbekistan	59,686	0%	--	--	399,957	728%	NA	NA	2,712	14%
Total	771,993	(5)	166,805	(5)	4,586,374	16%	1,865,728	7%	12,838	12%
Share of world total	27%	-1%	8%	(5)	17%	12%	7%	9%	25%	6%
Central Europe and Balkans:										
Albania	11	-5%	--	--	2,989	12%	--	--	--	--
Bosnia and Herzegovina	--	--	--	--	--	--	807	--	--	--
Bulgaria	537	61%	--	--	197	-10%	25,000	--	708	--
Croatia	2	-1%	--	--	8,400	-2%	33,030	--	--	--
Czech Republic	356	103%	--	--	1,920	2%	35,000	--	513	--
Hungary	3	-1%	--	--	7,200	-14%	40,000	--	--	--
Macedonia	--	--	--	--	--	--	7,000	13%	--	--
Poland	5,742	2%	--	--	6,299	-4%	117,440	-6%	--	--
Romania	12,472	-6%	--	--	40,000	-2%	70,000	-7%	--	--
Serbia and Montenegro	320	1%	--	--	4,815	(5)	16,882	--	--	--
Slovakia	-- [8]	--	--	--	350	--	44,500	--	--	--
Slovenia	4	-14%	--	--	2,207	-13%	--	--	--	--
Total	19,448	-2%	--	--	74,377	-3%	389,659	-3%	1,035	--
Share of world total	1%	-3%	--	--	(5)	-6%	1%	-1%	2%	-20%

See footnotes at end of table.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

(Thousand metric tons unless otherwise specified)

	Minerals fuels--Continued									
	Natural gas				Petroleum				Uranium, U_3O_8 content	
	Dry		Plant liquids		Crude		Refinery products			
Region and/or country	Quantity (million cubic meters)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (thousand 42-gallon barrels)	Percent change[4]	Quantity (metric tons)	Percent change[4]
Western Europe:										
European Free Trade Association:										
Iceland	--	--	--	--	--	--	--	--	--	--
Norway	84,964	8%	60,879	16%	964,290	-6%	112,964	10%	--	--
Switzerland	--	--	--	--	--	--	35,100	--	--	--
Total	84,964	8%	60,879	16%	964,290	-6%	148,000	7%	--	--
European Union (EU):										
Austria	1,200	--	--	--	6,413	-5%	90,542	-1%	--	--
Belgium	--	--	--	--	--	--	262,000	--	--	--
Denmark-Greenland	9,200	12%	48,000	2%	131,000	-3%	61,000	2%	--	--
Finland	--	--	--	--	--	--	78,796	29%	--	--
France	1,400	5%	--	--	8,550	--	701,000	(5)	--	--
Germany	18,900	-2%	--	--	26,200	2%	960,000	2%	94	4%
Greece	16	-30%	140	--	756	-24%	179,000	2%	--	--
Ireland	2,500	--	--	--	--	--	21,000	--	--	--
Italy	13,000	3%	350	--	30,000	--	691,000	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--	--
Netherlands	74,000	--	160,000	--	17,000	--	608,000	--	--	--
Portugal	--	--	--	--	--	--	98,500	--	--	--
Spain	174	-53%	--	--	1,261	-34%	459,000	--	--	-100%
Sweden	--	--	--	--	--	--	161,000	1%	--	--
United Kingdom	100,000	--	60,000	--	735,000	--	660,000	--	--	--
Total	220,390	(5)	268,490	(5)	956,180	-1%	5,030,838	1%	94	-68%
Total Western Europe	305,354	2%	329,369	3%	1,920,470	-3%	5,178,902	1%	94	-68%
Share of world total	11%	1%	15%	2%	7%	-6%	19%	3%	(5)	-69%
Total Europe and Central Eurasia	1,096,795	1%	496,174	2%	6,581,220	9%	7,434,290	2%	14,153	9%
Share of world total	39%	-1%	22%	2%	24%	6%	28%	4%	28%	3%
United States[7]	536,625	-3%	626,703	-5%	1,890,106	-5%	5,686,470	-13%	1,220	18%
Share of world total	19%	-4%	28%	-6%	7%	-8%	21%	-11%	2%	11%
World total[7]	2,820,478	1%	2,206,285	(5)	27,313,501	3%	26,565,501	-2%	50,929	6%

NA Not available. W Withheld to avoid disclosing proprietary data; not included in region and world totals. -- Zero or zero percent.

[1]Table includes data available as of March 31, 2006. Data may differ from that shown in individual country production tables elsewhere in this volume owing to the inclusion in this table of data received at a later date.

[2]Totals may not add due to independent rounding. Percentages are calculated on unrounded data.

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TABLE 4--Continued

EUROPE AND CENTRAL ASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2005[1, 2]

[3]Primary production also includes undifferentiated (primary and secondary) production for some countries listed.
[4]Percent change is calculated for each region and/or country by taking 100 times the difference of the current year's data over last year's data minus 100.
[5]Less than 0.1 percent.
[6]Less than 1/2 unit.
[7]U.S. data and world totals are rounded to no more than three significant digits.
[8]Reported as manufactured coke oven gas.

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TABLE 5

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF BAUXITE[1]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
France	490	75	185	168	--	--	--
Greece	2,490	2,200	1,970	2,441	2,400	2,200	2,200
Italy	(2)	11	300	300	100	--	--
Total	2,980	2,290	2,460	2,910	2,500	2,200	2,200
Central Europe:							
Albania	26	--	5	--	5	5	5
Bosnia and Herzegovina	1,700	75	255	900	950	950	1,000
Croatia	309	2	--	--	--	--	--
Hungary	2,560	1,020	1,050	535	600	600	600
Romania	243	175	--	--	--	--	--
Serbia and Montenegro	940	60	630	600	700	700	800
Total	5,780	1,330	1,940	2,040	2,300	2,300	2,400
Central Eurasia:							
Kazakhstan	3,100	3,071	3,730	4,800	5,000	5,200	5,500
Russia	4,000	4,000	5,270	6,600	7,000	7,500	8,000
Total	7,100	7,070	9,000	11,400	12,000	13,000	14,000
Regional total	15,900	10,700	13,400	16,400	17,000	18,000	19,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

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TABLE 6

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF ALUMINUM (PRIMARY)[1]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
France	325	366	441	442	400	400	400
Germany	720	575	644	648	530	530	530
Greece	149	144	168	163	150	150	150
Iceland	87	100	224	273	350	500	600
Italy	232	178	190	193	200	190	190
Netherlands	269	216	302	330	330	330	330
Norway	894	903	1,030	1,377	1,100	900	800
Spain	353	362	366	394	420	420	400
Sweden	126	118	101	103	100	110	110
Switzerland	72	21	36	45	--	--	--
United Kingdom	294	238	305	368	360	350	300
Total	3,520	3,220	3,810	4,340	3,900	3,900	3,800
Central Europe:							
Bosnia and Herzegovina	89	15	90	131	130	130	130
Croatia	74	31	15	4	--	--	--
Hungary	105	29	34	31	35	35	35
Poland	46	56	47	43	53	53	53
Romania	178	144	179	244	220	220	220
Serbia and Montenegro	81	17	88	117	120	120	120
Slovakia	30	38	137	158	170	170	170
Slovenia	100	58	84	139	120	120	120
Total	703	388	674	867	850	850	850
Central Eurasia:							
Azerbaijan	50	27	--	32	40	60	110
Kazakhstan	--	--	--	0	20	120	200
Russia	2,700	2,720	3,250	3,647	4,100	4,300	4,500
Tajikistan	450	230	269	380	440	500	600
Ukraine	100	98	104	114	120	120	120
Total	3,300	3,080	3,620	4,170	4,700	5,100	5,500
Regional total	7,520	6,690	8,100	9,380	9,500	9,900	10,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 7

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF ALUMINUM (SECONDARY)[1]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	36	94	158	151	150	150	100
Belgium	7	4	1	[2]	1	--	--
Denmark-Greenland	11	35	16	50	20	22	22
Finland	24	35	45	33	37	37	35
France	208	231	260	222	225	225	200
Germany	590	531	572	704	710	720	730
Greece	3	3	3	3	3	2	2
Italy	350	412	658	654	600	500	500
Netherlands	134	192	119	50	50	50	50
Norway	49	56	255	362	350	350	350
Portugal	NA	NA	18	18	16	15	15
Spain	63	107	241	293	250	250	200
Sweden	30	23	26	30	30	32	32
Switzerland	34	28	189	193	45	40	40
United Kingdom	121	282	285	205	200	200	150
Total	1,660	2,030	2,850	2,970	2,700	2,600	2,400
Central Europe:							
Bosnia and Herzegovina	10	10	5	5	5	5	5
Bulgaria	5	5	8	2	2	2	2
Czech Republic	--	48	40	15	50	50	50
Hungary	30	4	55	50	70	70	70
Macedonia	5	4	5	3	5	10	10
Poland	--	5	5	7	5	5	5
Romania	10	3	2	5	5	5	5
Total	60	79	120	87	140	150	150
Central Eurasia:[3]							
Ukraine	NA	98	129	140	130	130	140
Uzbekistan	NA	3	2	3	3	3	3
Total	NA	101	131	143	130	130	140
Regional total	1,720	2,210	3,100	3,200	3,000	2,900	2,700

[e]Estimated. NA Not available. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

[3]Information about the amount of secondary aluminum collected and processed in the other member countries of the Commonwealth of Independent States is unavailable.

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TABLE 8

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF COPPER (MINE OUTPUT)[1]

(Cu content in thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Finland	13	10	14	15	16	16	16
France	(2)	(2)	(2)	--	--	--	--
Norway	20	7	--	--	--	--	--
Portugal	160	130	76	90	90	90	90
Spain	13	25	23	5	1	1	--
Sweden	74	84	78	98	70	70	90
United Kingdom	1	--	--	--	--	--	--
Total	281	255	192	208	180	180	200
Central Europe:							
Albania	12	4	--	--	--	--	--
Bulgaria	26	76	92	80	90	90	90
Macedonia	7	6	6	22	15	15	20
Poland	329	384	509	526	550	550	550
Romania	32	25	16	15	20	25	25
Serbia and Montenegro	110	75	56	26	40	50	75
Slovakia	3	--	(2)	2	--	--	--
Total	519	569	679	669	720	730	760
Central Eurasia:							
Armenia	15	8	12	16	25	30	40
Georgia	10	5	8	12	15	20	30
Kazakhstan	400	200	430	402	500	520	600
Russia	650	525	570	700	750	800	900
Uzbekistan	70	40	70	100	110	120	130
Total	1,150	778	1,090	1,230	1,400	1,500	1,700
Regional total	1,950	1,600	1,960	2,110	2,300	2,400	2,700

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

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TABLE 9
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTIOIN OF REFINED COPPER
(PRIMARY AND SECONDARY)[1]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	36	54	79	72	70	50	50
Belgium	332	376	423	400	390	400	400
Finland	65	74	114	136	130	140	140
France	44	43	2	--	--	--	--
Germany	476	616	710	639	640	640	640
Italy	83	98	73	32	30	30	25
Norway	37	34	27	39	36	38	38
Spain	171	164	316	302	270	320	320
Sweden	97	105	130	222	250	260	270
United Kingdom	122	55	3	--	--	--	--
Total	1,460	1,620	1,880	1,840	1,800	1,900	1,900
Central Europe:							
Albania	11	3	--	--	--	--	--
Bulgaria	24	29	32	61	50	50	50
Czech Republic	21	20	20	14	15	20	20
Hungary	13	11	12	10	5	5	5
Poland	346	407	486	560	550	550	550
Romania	44	27	19	23	30	30	30
Serbia and Montenegro	151	79	46	29	50	50	60
Slovakia	25	29	--	--	--	--	--
Total	635	604	615	697	700	710	720
Central Eurasia:							
Kazakhstan	365	256	395	419	500	550	600
Russia	700	560	840	933	1,000	1,100	1,200
Uzbekistan	110	95	85	115	120	130	140
Total	1,180	911	1,320	1,470	1,600	1,800	1,900
Regional total	3,280	3,140	3,820	4,010	4,100	4,400	4,500

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 10

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF GOLD (MINE OUTPUT)[1]

(Kilograms)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Finland	2,810	2,060	4,950	5,600	5,200	5,300	5,300
France	4,240	4,620	2,630	--	--	--	--
Italy	--	--	791	100	100	100	100
Portugal	276	--	--	--	--	--	--
Spain	6,810	4,130	4,310	5,500	6,000	6,000	5,000
Sweden	6,330	6,530	3,570	4,400	5,600	5,800	6,000
Total	20,500	17,300	16,300	15,600	17,000	17,000	16,000
Central Europe:							
Bulgaria	2,400	3,100	2,350	3,868	2,500	3,000	3,500
Macedonia	--	760	750	750	500	500	700
Poland	300	510	367	530	450	450	450
Romania	3,000	4,000	500	400	600	600	600
Serbia and Montenegro	8,170	3,040	1,120	400	3,000	3,000	3,000
Slovakia	500	518	306	--	100	100	100
Total	14,400	11,900	5,390	5,950	7,200	7,700	8,400
Central Eurasia:							
Armenia	1,000	514	600	1,400	3,000	3,500	4,000
Georgia	2,000	500	2,920	2,000	3,000	3,500	4,000
Kazakhstan	30,000	18,200	28,200	18,062	25,000	30,000	35,000
Kyrgyzstan	2,000	1,500	22,000	16,700	19,000	22,000	25,000
Russia	183,000	132,000	143,000	169,297	165,000	170,000	190,000
Tajikistan	2,500	500	2,700	3,000	5,000	6,000	8,000
Uzbekistan	65,000	65,000	85,000	90,000	100,000	110,000	120,000
Total	286,000	218,000	284,000	300,000	320,000	350,000	390,000
Regional total	321,000	247,000	306,000	322,000	340,000	370,000	410,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 11

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF IRON ORE (MINE OUTPUT)[1]

(Fe content in thousand metric tons)

Region and country	Average iron content	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:								
Western Europe:								
Austria	58%	653	709	586	655	600	500	500
France	28%	2,790	432	--	--	--	--	--
Germany[2]	14%	12	10	65	38	50	50	50
Greece	38%	861	800	575	575	580	580	500
Norway	62%	1,350	1,350	369	690	360	340	320
Portugal	36%	5	5	12	10	8	8	6
Spain	38%	1,440	960	--	--	--	--	--
Sweden	65%	12,900	13,900	13,600	15,300	16,000	17,000	17,000
United Kingdom	54%	12	1	1	(3)	(3)	(3)	(3)
Total	XX	20,000	18,200	15,200	17,300	18,000	18,000	18,000
Central Europe:								
Albania	45%	410	--	--	--	--	--	--
Bosnia and Herzegovina	53%	1,580	52	182	150	500	550	550
Bulgaria	50%	270	265	178	--	20	20	20
Czech Republic	29%	60	10	6	--	--	--	--
Macedonia	40%	3	1	9	1	1	1	1
Poland	50%	(3)	--	--	--	--	--	--
Romania	52%	275	147	55	69	75	75	75
Serbia and Montenegro	45%	650	61	1	--	--	--	--
Slovakia	34%	480	225	255	180	200	200	200
Total	XX	3,730	761	686	400	800	850	850
Central Eurasia:								
Azerbaijan	57%	275	1	--	4	15	20	25
Kazakhstan	57%	13,000	8,000	9,200	9,300	13,000	14,000	15,000
Russia	58%	60,000	46,000	50,000	56,100	62,000	64,000	66,000
Ukraine	55%	50,000	29,000	30,600	37,700	41,000	45,000	47,000
Total	XX	123,000	83,000	89,800	103,000	116,000	123,000	128,000
Regional total	XX	147,000	102,000	106,000	121,000	135,000	142,000	147,000

[e]Estimated. XX Not applicable. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to use in the steel industry.

[3]Less than 1/2 unit.

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TABLE 12

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF CRUDE STEEL[1]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	4,240	4,540	5,730	7,031	7,000	6,000	5,000
Belgium	11,400	11,600	11,600	10,422	11,000	11,000	10,000
Denmark-Greenland	610	654	803	--	--	--	--
Finland	2,860	3,180	4,100	4,738	5,000	5,000	5,000
France	19,000	18,100	21,000	19,500	20,000	20,000	20,000
Germany	44,000	42,100	46,400	44,524	47,000	47,000	47,000
Greece	999	939	1,090	2,266	2,200	2,200	2,000
Ireland	326	309	342	--	--	--	--
Italy	25,400	27,800	26,500	28,913	28,000	26,000	26,000
Luxembourg	3,560	2,610	2,570	2,194	2,700	2,600	2,600
Netherlands	5,410	6,410	5,670	6,919	6,500	6,500	6,500
Norway	376	503	620	690	710	700	700
Portugal	744	829	1,100	725	800	800	800
Spain	12,700	14,000	15,800	17,800	17,000	17,000	17,000
Sweden	4,450	4,950	5,230	6,000	6,000	6,000	6,000
Switzerland	970	1,000	1,020	1,200	1,200	1,000	1,000
United Kingdom	17,900	17,600	15,300	13,200	14,000	14,000	13,000
Total	155,000	157,000	165,000	166,000	170,000	170,000	160,000
Central Europe:							
Albania	65	22	65	140	100	100	100
Bosnia and Herzegovina	1,650	--	134	283	250	500	600
Bulgaria	2,190	2,720	2,020	2,400	2,500	2,500	2,500
Croatia	424	45	71	69	45	45	45
Czech Republic	10,000	7,190	6,220	6,200	7,000	7,000	7,000
Hungary	2,960	1,870	1,970	1,962	2,000	2,000	2,000
Macedonia	247	33	161	350	300	300	300
Poland	13,600	11,900	10,500	8,336	10,000	9,000	9,000
Romania	9,760	6,560	4,670	5,632	5,500	5,500	5,500
Serbia and Montenegro	1,010	180	682	1,286	750	750	750
Slovakia	4,780	3,960	3,730	4,242	4,500	4,500	4,500
Slovenia	504	407	519	585	500	500	500
Total	47,200	34,900	30,700	31,500	33,000	33,000	33,000
Central Eurasia:							
Azerbaijan	NA	12	--	59	100	150	200
Belarus	NA	744	1,620	2,076	2,400	2,500	2,500
Georgia	1,200	84	(2)	--	--	--	200
Kazakhstan	6,750	3,030	4,770	4,452	5,500	5,700	5,800
Latvia	500	279	500	550	550	550	550
Moldova	NA	663	909	1,000	800	1,100	1,200
Russia	89,600	51,600	59,100	66,186	72,000	74,000	76,000
Ukraine	55,000	23,300	31,800	38,636	40,000	41,000	42,000
Uzbekistan	NA	352	420	607	650	700	700
Total	153,000	80,100	99,100	114,000	120,000	130,000	130,000
Regional total	355,000	272,000	295,000	312,000	320,000	330,000	320,000

[e]Estimated. NA Not available. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

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TABLE 13

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF LEAD (MINE OUTPUT)[1]

(Pb content in metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
France	1,140	--	--	--	--	--	--
Germany	8,600	--	--	--	--	--	--
Greece	26,200	14,300	18,200	3,000	16,000	16,000	18,000
Ireland	35,300	46,100	57,800	63,810	66,000	66,000	60,000
Italy	15,600	15,400	2,000	1,000	100	--	--
Spain	61,500	30,300	40,300	--	--	--	--
Sweden	98,300	137,000	107,000	58,700	50,000	40,000	30,000
United Kingdom	1,380	1,600	1,000	1,000	500	500	300
Total	248,000	245,000	226,000	128,000	130,000	120,000	110,000
Central Europe:							
Bosnia and Herzegovina	7,500	150	200	850	--	--	--
Bulgaria	57,000	33,000	10,500	22,000	25,000	25,000	25,000
Macedonia	15,000	17,000	24,000	--	15,000	15,000	15,000
Poland	90,300	99,400	114,000	60,000	70,000	60,000	60,000
Romania	25,100	23,200	18,800	11,610	20,000	20,000	20,000
Serbia and Montenegro	15,200	3,300	10,500	1,800	1,500	1,500	2,000
Total	210,000	176,000	178,000	96,300	130,000	120,000	120,000
Central Eurasia:							
Georgia	NA	NA	200	400	400	450	500
Kazakhstan	200,000	70,000	40,000	44,000	46,000	49,000	55,000
Russia	30,000	23,000	13,300	36,000	38,000	40,000	44,000
Tajikistan	2,000	500	800	800	1,000	1,000	1,000
Total	232,000	93,500	54,300	81,200	85,000	90,000	100,000
Regional total	690,000	515,000	458,000	306,000	350,000	330,000	330,000

[e]Estimated. NA Not available. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 14

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF REFINED LEAD[1]

(Metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Belgium	69,800	95,300	12,000	--	--	--	--
France	162,000	129,000	110,000	--	--	--	--
Germany	208,000	147,000	170,000	118,778	110,000	100,000	90,000
Italy	64,600	84,900	75,000	49,500	35,000	30,000	25,000
Sweden	47,500	39,700	30,600	30,000	25,000	22,000	20,000
United Kingdom	156,000	150,000	166,000	125,900	150,000	150,000	150,000
Total	708,000	646,000	564,000	324,000	320,000	300,000	290,000
Central Europe:							
Bosnia and Herzegovina	250	100	100	50	--	--	--
Bulgaria	66,600	71,200	84,100	81,000	75,000	75,000	75,000
Macedonia	22,000	22,500	22,900	--	5,000	15,000	15,000
Poland[2]	64,800	66,400	55,900	18,000	25,000	25,000	20,000
Romania	15,700	22,000	25,000	32,903	35,000	35,000	35,000
Serbia and Montenegro	48,000	23,600	1,240	--	1,000	1,000	1,000
Total	217,000	206,000	189,000	132,000	140,000	150,000	150,000
Central Eurasia:							
Kazakhstan	290,000	88,500	186,000	131,316	140,000	145,000	150,000
Russia[2]	35,000	23,000	59,000	66,000	70,000	75,000	80,000
Total	325,000	112,000	245,000	197,000	210,000	220,000	230,000
Regional total	1,250,000	964,000	998,000	653,000	670,000	670,000	670,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes some secondary refined lead.

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TABLE 15

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF REFINED LEAD (SECONDARY)[1]

(Metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	15,100	21,900	24,000	22,000	20,000	15,000	15,000
Belgium	21,200	30,000	98,000	60,000	60,000	50,000	50,000
France	108,000	168,000	158,000	105,500	100,000	75,000	50,000
Germany	187,000	164,000	204,000	222,932	240,000	250,000	250,000
Greece	5,000	5,000	5,000	4,000	4,000	4,000	3,000
Ireland	15,000	11,000	9,000	19,992	6,000	5,000	5,000
Italy	102,000	95,500	160,000	161,500	160,000	150,000	100,000
Netherlands	44,000	20,000	22,200	17,000	15,000	15,000	10,000
Portugal	6,000	7,700	5,000	3,000	3,000	3,000	2,000
Spain	50,000	80,000	120,000	110,000	100,000	75,000	50,000
Sweden	22,100	51,500	47,300	50,000	48,000	46,000	45,000
Switzerland	6,000	6,000	10,100	8,000	7,000	6,000	5,000
United Kingdom	174,000	171,000	171,000	120,000	50,000	30,000	25,000
Total	755,000	832,000	1,030,000	904,000	810,000	720,000	610,000
Central Europe:							
Czech Republic	NA	20,000	25,000	25,000	35,000	35,000	35,000
Poland[2]	NA	--	--	36,000	45,000	45,000	45,000
Romania	5,000	4,000	3,000	5,000	5,000	5,000	5,000
Slovenia	12,200	7,240	15,300	15,400	15,000	15,000	15,000
Total	17,200	31,200	43,300	81,400	100,000	100,000	100,000
Central Eurasia, Ukraine	10,000	10,000	15,000	6,000	8,000	9,000	10,000
Regional total	782,000	873,000	1,090,000	991,000	920,000	830,000	720,000

[e]Estimated. NA Not available. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Through 2004, data concerning secondary refined production was either not available or only included as part of primary refined production.

TABLE 16

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF NICKEL (MINE OUTPUT)[1]

(Ni content in metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Finland	11,500	3,440	10,700	40,897	46,000	47,000	48,000
Greece	18,500	19,900	19,500	23,210	22,000	22,000	22,000
Norway	3,100	3,390	2,540	150	--	--	--
Spain	--	--	--	5,380	8,000	10,000	10,000
Total	33,100	26,700	32,700	69,600	76,000	79,000	80,000
Central Europe:							
Albania	8,800	--	--	--	--	--	--
Macedonia	--	3,500	--	--	--	--	--
Total	8,800	3,500	--	--	--	--	--
Central Eurasia:							
Russia	380,000	250,000	315,000	320,000	320,000	325,000	330,000
Ukraine	6,000	1,400	--	2,000	2,000	2,000	2,000
Total	386,000	251,000	315,000	322,000	320,000	330,000	330,000
Regional total	428,000	281,000	348,000	392,000	400,000	410,000	410,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 17
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF PLATINUM (MINE OUTPUT)

(Kilograms)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Finland	60	37	441	678	730	780	800
Norway	1,500	1,500	1,000	--	--	--	--
Total	1,560	1,540	1,440	678	730	780	800
Central Europe:							
Poland	--	21	21	20	20	20	20
Serbia and Montenegro	21	6	3	1	1	1	1
Total	21	27	24	21	21	21	21
Central Eurasia, Russia[1]	44,000	31,000	27,000	30,000	29,000	30,000	31,000
Regional total	45,600	32,600	28,500	30,700	30,000	31,000	32,000

[e]Estimated. -- Zero.
[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 18
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF PALLADIUM (MINE OUTPUT)[1]

(Kilograms)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Central Europe:							
Poland	--	12	12	10	10	10	10
Serbia and Montenegro	130	46	21	8	8	8	8
Total	130	58	33	18	18	18	18
Central Eurasia, Russia	91,000	65,000	95,000	97,400	95,000	97,000	100,000
Regional total	91,100	65,100	95,000	97,400	95,000	97,000	100,000

[e]Estimated. -- Zero.
[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 19

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF ZINC (MINE OUTPUT)[1]

(Zn content in metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Finland	51,700	16,400	30,500	72,474	73,000	73,000	74,000
France	23,900	--	--	--	--	--	--
Germany	58,100	--	--	--	--	--	--
Greece	26,700	15,100	20,300	--	16,000	16,000	16,000
Ireland	166,000	184,000	263,000	428,596	440,000	460,000	480,000
Italy	42,400	23,100	--	--	--	--	--
Norway	17,500	9,880	--	--	--	--	--
Portugal	--	--	--	--	130,000	135,000	135,000
Spain	258,000	172,000	200,000	--	--	--	--
Sweden	164,000	167,000	177,000	214,600	220,000	220,000	200,000
United Kingdom	6,670	--	--	--	--	--	--
Total	815,000	587,000	691,000	716,000	880,000	900,000	910,000
Central Europe:							
Bosnia and Herzegovina	15,200	300	300	900	--	--	--
Bulgaria	35,000	26,000	9,400	22,000	20,000	20,000	20,000
Macedonia	32,000	8,300	25,000	--	10,000	10,000	10,000
Poland	153,000	155,000	156,900	117,200	150,000	150,000	130,000
Romania	36,000	34,700	27,500	13,784	25,000	30,000	30,000
Serbia and Montenegro	9,500	3,200	21,000	3,000	6,000	8,000	8,000
Total	281,000	228,000	240,000	157,000	210,000	220,000	200,000
Central Eurasia:							
Armenia	--	700	528	3,186	800	800	1,000
Georgia	--	--	200	400	400	400	400
Kazakhstan	315,000	225,000	325,000	400,000	420,000	440,000	470,000
Russia	170,000	131,000	136,000	200,000	210,000	220,000	250,000
Total	485,000	357,000	462,000	604,000	630,000	660,000	720,000
Regional total	1,580,000	1,170,000	1,390,000	1,480,000	1,700,000	1,800,000	1,800,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 20
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF REFINED ZINC
(PRIMARY AND SECONDARY)[1]

(Metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	26,900	--	--	--	--	--	--
Belgium	357,000	211,000	252,000	300,000	300,000	250,000	250,000
Finland	175,000	177,000	223,000	281,905	290,000	290,000	290,000
France	264,000	314,000	348,000	210,000	150,000	150,000	150,000
Germany	338,000	322,000	357,000	334,891	330,000	310,000	320,000
Italy	248,000	260,000	170,000	121,000	100,000	100,000	100,000
Netherlands	209,000	208,000	217,000	213,800	230,000	230,000	200,000
Norway	125,000	122,000	126,000	133,300	135,000	140,000	140,000
Portugal	5,500	4,000	3,600	3,000	3,000	3,000	3,000
Spain	253,000	358,000	387,000	501,400	530,000	530,000	500,000
United Kingdom	93,300	106,000	99,600	--	--	--	--
Total	2,090,000	2,080,000	2,180,000	2,100,000	2,100,000	2,000,000	2,000,000
Central Europe:							
Bosnia and Herzegovina	15,000	300	--	--	--	--	--
Bulgaria	75,500	79,700	84,200	95,100	100,000	100,000	100,000
Czech Republic	NA	1,000	150	250	250	250	250
Macedonia	34,100	21,300	62,800	--	10,000	10,000	10,000
Poland	132,000	166,000	173,000	155,000	160,000	160,000	160,000
Romania	11,500	28,300	51,900	49,447	50,000	50,000	50,000
Serbia and Montenegro	61,300	6,000	8,290	20,000	100	150	150
Total	329,000	303,000	380,000	320,000	320,000	320,000	320,000
Central Eurasia:							
Kazakhstan	315,000	239,000	262,000	356,907	370,000	380,000	420,000
Russia	250,000	166,000	230,000	210,000	230,000	240,000	250,000
Uzbekistan	70,000	70,000	18,000	30,000	50,000	60,000	70,000
Total	635,000	475,000	510,000	597,000	650,000	680,000	740,000
Regional total	3,050,000	2,860,000	3,070,000	3,020,000	3,100,000	3,000,000	3,100,000

[e]Estimated. NA Not available. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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TABLE 21

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF NATURAL DIAMOND[1, 2]

(Thousand carats)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Central Eurasia, Russia:							
Gem grade	18,000	17,000	17,500	23,000	24,000	25,000	26,000
Industrial grade	12,000	11,000	11,700	15,000	15,000	16,000	17,000
Regional total	30,000	28,000	29,200	38,000	39,000	41,000	43,000

[e]Estimated.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]The large increase in Russian diamond production reflects mainly newly released Russian diamond production data. Future volumes will reflect revised historic Russian diamond production data.

TABLE 22

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PHOSPHATE ROCK PRODUCTION, 1990-2011[1]

(P_2O_5 content in thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Denmark-Greenland	(2)	(2)	(2)	(2)	1	1	1
Finland	201	243	277	300	300	310	310
Total	201	243	277	300	300	310	310
Central Eurasia:							
Kazakhstan	2,900	2	10	52	80	120	150
Russia	12,000	3,400	4,450	4,500	4,550	4,600	4,400
Uzbekistan	--	--	36	102	130	150	170
Total	14,900	3,400	4,500	4,650	4,800	4,900	4,700
Regional total	15,100	3,640	4,780	4,950	5,100	5,200	5,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

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TABLE 23

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF MARKETABLE COAL[1, 2]

(Thousand metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
Austria	2,450	1,250	1,260	6	6	5	--
France	12,700	7,010	4,100	--	--	--	--
Germany	427,000	260,000	201,000	203,605	200,000	200,000	190,000
Greece	49,900	56,600	64,000	73,585	65,000	65,000	65,000
Italy	15,500	352	14	--	10	10	10
Norway	358	343	330	300	250	220	200
Spain	35,900	23,300	23,500	17,500	16,000	15,000	14,000
Sweden	11	--	--	--	--	--	--
United Kingdom	94,400	53,000	32,000	20,600	21,000	21,000	20,000
Total	638,000	402,000	326,000	316,000	300,000	300,000	290,000
Central Europe:							
Albania	2,070	81	21	12	20	20	20
Bosnia and Herzegovina	18,200	1,810	7,440	9,000	10,000	10,000	10,000
Bulgaria	31,700	30,800	27,100	24,910	27,000	27,000	27,000
Croatia	155	75	--	--	--	--	--
Czech Republic	124,000	80,100	68,100	61,900	65,000	65,000	65,000
Hungary	17,600	14,500	14,300	9,580	14,000	14,000	14,000
Macedonia	6,640	7,990	7,520	8,200	8,000	8,000	8,000
Poland	205,000	201,000	163,000	159,040	170,000	170,000	170,000
Romania	38,200	41,100	29,300	31,122	35,000	35,000	35,000
Serbia and Montenegro	44,700	40,600	32,300	35,400	40,000	40,000	40,000
Slovakia	4,770	4,140	3,590	2,511	3,500	3,500	3,500
Slovenia	5,580	4,880	4,480	4,539	4,500	4,500	4,500
Total	499,000	427,000	357,000	346,000	380,000	380,000	380,000
Central Eurasia:							
Georgia	800	40	7	8	10	10	10
Kazakhstan	131,000	113,000	74,900	86,385	90,000	95,000	100,000
Kyrgyzstan	3,400	500	425	3,318	340	350	350
Russia	395,000	263,000	274,000	298,000	320,000	330,000	340,000
Tajikistan	300	100	21	95	95	100	105
Ukraine	136,000	83,800	81,900	77,900	83,000	85,000	80,000
Uzbekistan	3,200	3,200	2,560	2,700	3,500	4,000	4,500
Total	670,000	464,000	434,000	468,000	500,000	514,000	520,000
Regional total	1,810,000	1,290,000	1,120,000	1,130,000	1,200,000	1,200,000	1,200,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes anthracite, bituminous, and run-of-mine lignite.

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TABLE 24

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRODUCTION OF URANIUM[1]

(U content in metric tons)

Region and country	1990	1995	2000	2005	2007[e]	2009[e]	2011[e]
Europe:							
Western Europe:							
France	2,780	712	318	--	--	--	--
Germany	2,530	297	237	80	70	60	50
Portugal	76	22	13	--	--	--	--
Spain	193	356	294	--	--	--	--
Total	5,580	1,390	862	80	70	60	50
Central Europe:							
Bulgaria	700	600	600	600	600	600	600
Czech Republic	2,540	611	498	435	450	450	450
Hungary	--	277	--	--	--	--	--
Slovakia	34	--	--	--	--	--	--
Total	3,270	1,490	1,100	1,040	1,100	1,100	1,100
Central Eurasia:							
Kazakhstan	3,000	1,630	1,740	4,357	6,400	10,000	13,000
Russia	4,000	2,250	2,500	3,430	3,700	4,000	4,300
Ukraine	1,000	500	600	800	900	1,200	1,500
Uzbekistan	3,000	1,800	2,350	2,300	2,300	2,500	3,000
Total	11,000	6,180	7,190	10,900	13,000	18,000	22,000
Regional total	19,900	9,060	9,150	12,000	13,000	19,000	23,000

[e]Estimated. -- Zero.

[1]Historic data, estimated data, and totals are rounded to no more than three significant digits; may not add to totals shown.

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The Mineral Industry of Austria

By Harold R. Newman

Although the mining industry had a long tradition in Austria, metal mining sector activity has declined during the past few years owing principally to environmental issues, high mining costs, low ore grades and reserves, and increased foreign competition. All metal mines, except the open pit iron ore operation at Erzberg and the underground tungsten operation at Mittersill, were closed. With the exception of secondary lead, recycling activities were decreasing. Most of the growth in the mineral industry was in the private sector production of industrial minerals. This sector produced a number of important minerals, such as gypsum, magnesite, salt, and talc (table 1).

Austria is a landlocked country and has an area of 82,444 square kilometers; it borders the Czech Republic, Germany, Hungary, Italy, Slovenia, and Switzerland. The major river for navigation is the Danube. In 2005, the gross domestic product based on purchasing power parity was $275 billion, and the per capita income based on purchasing power parity was $33,615. The inflation rate was 2.1%, and the unemployment rate was 5.2% (International Monetary Fund, 2006§[1]).

Environmental issues were forest degradation caused by air pollution from emissions by coal and oil-fired power stations and industrial plants. Soil pollution resulted from the use of agricultural chemicals. Natural hazards were avalanches, earthquakes, and landslides (U.S. Central Intelligence Agency, 2006§).

Österreichische Industrieholding AG (ÖIAG) was the investment and privatization agency of the Government. In line with its Government mandate, ÖIAG employs a double strategy—it both stimulates increases in the value of investments for which it is responsible and examines exit scenarios for the partial or complete privatization of those companies for which privatization is envisaged. Privatization of state-owned industries was continuing. For information on the structure of the mineral industry, see table 2.

Austria is dependent on foreign trade and has an open economy that is closely linked to the economies of other European Union (EU) member states. In 2005, imports of goods increased by 4.8% to 95.4 billion euros (€) ($118.3 billion[2]). Exports rose by 4.6% to €94 billion ($116.6 billion). The most important EU trading partners were Germany, with imports from Austria of €40.5 billion ($50.2 billion) and exports to Austria of €29.9 billion ($37.1 billion), and Italy with imports from Austria of €6.4 billion ($7.9 billion) and exports to Austria of €8.2 billion ($10.2 billion). The most important non-EU trading partner was the United States, with imports from Austria of €3.2 billion ($3.9 billion) and exports to Austria of €5.3 billion ($6.6 billion) (Statistik Austria, 2005§).

Austria Metall AG was Austria's leading producer of aluminum semifinished products and casting alloys for industrial processors. Austria Metall's production program included aircraft and automotive products, brazing sheet, cathode sheet, packaging, and products with sports applications. Cast alloys were used in the automobile industry and in the fields of electronics and mechanical engineering (Thompson Gale, 2005a§).

Montanwerke Brixlegg AG specialized in the production of copper. Montanwerke extracted pure metals, salts, and oxides from such copper-containing secondary materials as scrap metals, alloys, and residues through the refining process and was the only copper producer in Austria. Montanwerke exported more than 80% of its products (Montanwerke Brixlegg AG, 2005§).

The Province of Styria had the largest deposits of mineral resources in Austria. Voestalpine Erzberg GmbH produced about 2 million metric tons per year (Mt/yr) of iron ore with a content of 32% iron and 2% manganese by open pit mining from the Erzberg Mine. The main ore minerals were ankerite, ferrous dolomite, and siderite. Because of the high manganese content, the iron ore was rated as a high-quality raw material. The ore was no longer smelted at Eisernez but was shipped by rail to the steel mills of Voestalpine Stahl GmbH at Donawitz and Linz for further beneficiation and production of self-fluxing sinter that averaged 50% iron and 3% manganese (Bureau de Recherches Géologiques et Minières, 2005§).

Treibacher Industrie AG's Steel and Foundry Products Unit was a market leader for ferroalloys, such as ferromolybdenum and ferrovanadium. At the facility in Althofen, Treibacher processed spent catalysts and residues from the petrochemicals industry that contained molybdenum, nickel, and vanadium (Treibacher Industrie AG, 2005a§). Treibacher signed a long-term contract with one of the world's leading refineries, Total SA, which is located in Antwerp, Belgium. Total would supply Treibacher with spent catalysts that contained molybdenum, nickel, and vanadium to be processed in Treibacher's recycling facilities in Althofen (Treibacher Industrie AG, 2005b§).

Voestalpine Stahl GmbH was continuing with its Linz 2010 project, which would increase the production capacity for flat products to 5.5 Mt/yr from 4.4 Mt/yr by the end of 2008. Voestalpine announced that it had signed a long-term rail delivery agreement with Network Rail, which was the owner and operator of the former British Rail railway infrastructure. The contract value amount in the first year would be between €18 million and €24 million ($22 million and $30 million), which corresponds to a market share of about 25% of the United Kingdom's railway market (Voestalpine AG, 2005§).

ÖIAG sold the remaining shares of Voestalpine in August 2005, which marked an important chapter in the history of Austrian privatization. Voestalpine was a successful company and was one of the eight leading companies that trade on the Austrian Stock Exchange (ATX). Its stock value has almost

[1]References that include a section mark (§) are found in the Internet References Cited section.

[2]Where necessary, values have been converted from European Union euros (€) to U.S. dollars (US$) at the rate of €1.00=US$1.24.

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tripled since the shares were first introduced on the ATX in 1995 (Österreichische Industrieholding AG, 2005§).

Wolfram Bergbau und Hütten GmbH (WBH) operated one of the western world's leading tungsten mines at Mittersill and a tungsten conversion plant at Bergla. The production line started at the mine in Mittersill where scheelite (calcium tungstate) was extracted in an underground mining operation. The crude ore was transported to the ore-dressing plant in Bergla by an underground conveyor belt through a 3-kilometer-long tunnel. At the ore-dressing plant, the crude ore was converted into a scheelite concentrate using a flotation process. This concentrate met the bulk of the raw material demand for WBH and provided a source of concentrate that was both independent and secure (Wolfram Bergbau und Hütten GmbH, 2005a§).

Tungsten recycling was of increasing importance to WBH. The conversion of secondary materials is an important factor in both cost efficiency and reduced dependence on virgin raw materials. WBH treated tungsten-bearing secondary materials by means of chemical conversion and manufactured products according to customer requirements (Wolfram Bergbau und Hütten GmbH, 2005b§).

Increased building activity in 2005 was a benefit to the cement industry. Cement demand was met mostly by domestic production; imports constituted about 12.5% of the consumption of the building industry. Concrete was one of Austria's most popular building materials (Cement Austria AG, 2005§).

Lafarge Perlmooser AG was part of the Lafarge Group and was Austria's leading manufacturer of cement. Lafarge Perlmooser had cement plants at Mannesdorf and Retsnei and a grinding plant at Kirchbichl. The operations produced about 1.5 Mt/yr (Lafarge Perlmooser AG, 2005§).

GKB-Bergbau GmbH mined gravel, lignite, and mixed ores. The company was responsible for the Styrian Erzberg and the West-Styrian lignite mining areas. ÖeBAG conducted the execution of all mine closings and assurance measures, which included restoration. GKB-Bergbau was the holding company for ÖeBAG (Thompson Gale, 2005b§).

OMV Aktiengesellschaft was Austria's leading industrial company. It explored for natural gas and petroleum, and imported, transported, and stored natural gas.

OMV Austria Exploration & Production, which was a wholly owned subsidiary of OMV, made a second major gas discovery in 2005 in the Vienna Basin following the discovery of the Strasshof T4 well in April. The discovery was made during the drilling of the exploration well Ebenthal Tief 1 at a depth of about 3,400 meters. OMV estimated reserves to be 1.5 billion cubic meters, which is equal to about one-fifth of Austrian annual natural gas consumption. Ebenthal Tief 1 is located about 30 kilometers northeast of Vienna in the vicinity of the Matzen Field, which is the biggest contiguous oilfield in central Europe (Alexander's Gas & Oil Connections, 2005§).

Outlook

Because of Austria's long history of minerals exploration and a strong mining tradition, geologic conditions are fairly well known. Future mining activities will most likely be concentrated in industrial minerals, mainly for domestic consumption. The chances of finding new and workable base-metal deposits are probably small as the country has been well explored.

Internet References Cited

Alexander's Gas & Oil Connections, 2005 (December 5), OMV makes major gas discovery, accessed January 13, 2006, at URL http://www.gasandoil.com/goc/discover/dix60210.htm.

Bureau de Recherches Géologiques et Minières, 2005, Austrian site—Erzberg Mine, accessed June 16, 2006, at URL http://www2.brgm.fr/mineo/alpine.htm.

Cement Austria AG, 2005, Overview, accessed June 20, 2006, at URL http://www.Cemex.com/gl/gl_au.asp.

International Monetary Fund, 2006 (April), Austria, World Economic Outlook Database, accessed July 28, 2005, at URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcoutm.cfm.

Lafarge Perlmooser AG, 2005, Company profile, accessed June 20, 2006, at URL http://www.leitbetriebe.at/bau/lafarge/lafarge_engl.htm.

Montanwerke Brixlegg AG, 2005, Production, accessed June 14, 2006, at URL http://www.montanwerke-brixlegg.com/en/production.html.

Österreichische Industrieholding AG, 2005 (July 20), Final stage of Voest-Alpine privatisation, accessed June 19, 2006, at URL http://www.oeiag.at/english/komm/OIAG_20052007.shtm.

Statistik Austria, 2005, Austrian foreign trade in the year 2005, accessed June 14, 2006, at URL http://www.statistik.at/englisch/results/business/trade_txt.shtml.

Thompsom Gale, 2005a, Company description, accessed June 14, 2006, at URL http://goliath.ecnext.com/comsite5/bin/comsite5.pl.

Thompson Gale, 2005b, GKB-Bergbau GmbH, accessed June 20, 2006, at URL http://goliath.ecnext.com/coms2/product-compint-0000446814-page.html.

Treibacher Industrie AG, 2005a, Catalysts & residues, accessed June 19, 2006, at URL http://www.treibacher.com/838.html.

Treibacher Industrie AG, 2005b, Treibacher Industrie AG signs contract with Total, accessed June 19, 2006, at URL http://www.treibacher.com/1186_2983.htm.

U.S. Central Intelligence Agency, 2006 (June 6), Austria, World Factbook 2006, accessed June 13, 2006, at URL http://www.cia.gov/cia/publications/factbook/geos/au.html.

Voestalpine AG, 2005 (December 21), Network Rail and Voestalpine strengthen long-term business relations, accessed June 19, 2006, via URL http://www.voestalpine.com/ag/de/press.htm.

Wolfram Bergbau und Hütten GmbH, 2005a, Mittersill—Basis of products, accessed June 14, 2006, at URL http://www.wolfram.at/wolfram_at/wEnglisch/unternehmen/U_1_Bergbau32236554na.htm.

Wolfram Bergbau und Hütten GmbH, 2005b, Recycling, accessed June 14, 2006, at URL http://www.wolfram.at/wolfram_at/wEnglisch/produkte/recycling/RECYC_index.html.

Major Source of Information

Bundesministerium für Wirtschaft und Arbeit
Denisgasse 31
1200 Vienna, Austria

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TABLE 1
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
METALS						
Aluminum, metal, secondary	metric tons	149,900	151,100	155,000	160,000 [e]	151,200 [2]
Copper, refined, secondary	do.	68,642	64,932	65,084	74,245	72,316 [2]
Gold, metal[e]	kilograms	50	50	25	15	15
Iron and steel:						
Iron ore and concentrate:						
Gross weight		1,843	1,936	2,119	1,882 [r]	2,048 [2]
Fe content		581	621	678	602 [r]	655
Metal:						
Pig iron		4,375	4,669	4,677	4,847 [r]	5,444 [2]
Ferroalloys, electric arc furnace[e]		9	5	5	6	6
Crude steel		5,887	6,208	6,261	6,530 [e]	7,031 [2]
Semimanufactures		5,251	5,300	5,300 [e]	5,400 [e]	5,500
Lead, refined, secondary[e]	metric tons	22,000	21,000	18,000	24,000 [r]	22,000 [2]
Manganese, Mn content of domestic iron ore[e]	do.	18,000	16,000	16,000	16,000	16,000
Tungsten, mine output, W content of concentrate	do.	1,237	1,384	1,332	1,400 [e]	1,350
INDUSTRIAL MINERALS						
Cement, hydraulic		3,802 [r]	3,918 [r]	3,886	3,976	4,736 [2]
Clays:						
Illite		300 [e]	60	1,708 [r]	2,013 [r]	2,000
Kaolin:						
Crude		90 [e]	100	100 [r]	67 [r]	56 [2]
Other[e]:		2,600	2,600	2,600	2,600	2,500
Graphite, crude	metric tons	116	--	--	--	--
Gypsum and anhydrite, crude		929	962	1,004	1,039 [r]	1,113 [2]
Lime[e]		2,000	2,000	2,000	2,000	2,000
Magnesite:						
Crude		681	728	767	715 [r]	694 [2]
Sintered or dead-burned		202	200	200 [e]	267 [r]	304 [2]
Caustic calcined[e]		60	60	165 [r]	161 [r]	98 [2]
Nitrogen, N content of ammonia[e]	metric tons	440	400	400	440	400
Pigments, mineral, micaceous iron oxide[e]	do.	5,000	5,000	5,000	5,000	5,000
Pumice (trass)	do.	4,000 [e]	4,000	2,865 [r]	2,900 [r]	2,943 [2]
Salt:						
Rock[e]		1	1	1	1	1
In brine	thousand cubic meters	2,986	3,212	3,422	3,430 [2]	3,409 [2]
Sand and gravel:						
Quartz sand		700 [e]	835	944	864 [r]	1,704 [2]
Other sand and gravel		18,000 [e]	5,261	6,079	5,886 [r]	6,000
Total		18,700 [e]	6,096	7,023	6,750 [r]	7,704 [2]
Sodium compounds, n.e.s., manufactured:[e]						
Soda ash		150	150	150	150	100
Sulfate		100	100	100	100	100
Stone:[3]						
Dolomite		6,172	5,836	5,468 [r]	5,907 [r]	6,291 [2]
Quartz and quartzite		402	362	283	294 [r]	249 [2]
Total		6,574	6,198	5,751	6,201 [r]	6,540 [2]
Other:						
Limestone and marble		23,799	24,884	24,477	24,158 [r]	25,576 [2]
Basalt		5,000 [e]	4,533	4,669	5,197 [r]	3,166 [2]
Marl		1,569	1,534	1,069	1,747 [r]	1,479 [2]
Crushed stone[e]		12,000	12,000	12,000	5,858 [r]	4,917 [2]
Total		42,368	42,951	42,215	36,960 [r]	35,138 [2]
Grand total		48,942	49,149	47,966 [r]	43,161 [r]	41,678 [2]

See footnotes at end of table.

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TABLE 1--Continued
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
INDUSTRIAL MINERALS--Continued						
Sulfur, byproduct of petroleum and natural gas	metric tons	10,912	9,444	10,400 [r]	8,458 [r]	10,205 [2]
Talc and soapstone, crude	do.	137,776	138,195	137,596	136,305 [r]	137,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite		1,194	1,413	1,152	235 [r]	6 [2]
Coke		1,411	1,394	1,400 [e]	1,414 [r]	1,400
Natural gas:						
Gross	million cubic meters	1,954	2,015	2,030	2,011 [r]	1,654 [2]
Marketed[e]	do.	1,200	1,200	1,200	1,200	1,200
Oil shale	metric tons	408	336	432	855 [r]	891 [2]
Petroleum:						
Crude	thousand 42-gallon barrels	7,178	7,176	6,976	6,728 [r]	6,413 [2]
Refinery products:						
Liquefied petroleum gas	do.	4 [r]	159	580 [r]	661 [r]	1,241 [2]
Gasoline	do.	17,155 [r]	17,017	15,394	14,773 [r]	15,283 [2]
Kerosene and jet fuel	do.	4,380 [r]	3,888	3,576	3,534 [r]	4,596 [2]
Distillate fuel oil	do.	29,638 [r]	27,457	26,987	27,000	27,000
Residual fuel oil	do.	8,359 [r]	6,732	7,009	6,061 [r]	6,141 [2]
Unspecified	do.	13,834 [r]	30,387	29,169	33,075 [r]	31,654 [2]
Refinery fuel and losses	do.	6,862 [r]	4,550	4,739	5,068 [r]	4,627 [2]
Total	do.	80,232 [r]	90,190	87,454 [r]	91,809 [r]	90,542

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.
[1]Table includes data available through May 2006.
[2]Reported figure.
[3]Excludes stone used by the cement and iron and steel industries.

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TABLE 2
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, fused	Treibacher Schleifmittel AG	Plant at Villach	100.
Aluminum	Aluminum Lend GmbH (Salzburger Aluminium AG, 100%)	Secondary ingot plant at Lend	25.
Do.	Austria Metall AG	Secondary ingot plant at Ranshofen	50.
Cement	Lafarge Perlmooser AG (Lafarge Group, 100%)	Plants at Mannesdorf and Retsnei, grinding plant at Kirchbichl	2,200.
Do.	Wietersdorfer & Peggauer Zementwerke GmbH	Plants at Peggau and Wietersdorf	1,000.
Do.	Zementwerk Leube GmbH	Plant at Gartenau	700.
Do.	SPZ Zementwerke Eiberg GmbH	Plant at Eiberg	600.
Do.	Gmundner Zement	Plant at Gmundner	580.
Coal	Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH (Government, 100%)	Oberdorf Mine, Barnbach (closed)	1,200.
Copper, secondary	Montanwerke Brixlegg AG (A-Tec Industries, 91.6%)	Plant at Brixlegg	75 cathode, 66 billet.
Ferroalloys, FeV, FeMo, FeNi	Treibacher Industrie AG	Plants at Althofen and Treibach	10.
Graphite	Industrie und Bergbaugesellschaft Pryssok & Co KG	Trandorf Mine at Mühldorf	15.
Do.	Grafitbergbau Kaiserberg AG	Kaisersberg Mine	3.
Do.	do.	Trieben Mine	3.
Gypsum	Erste Salzburger Gipswerk-Gesellschaft Christian Moldan KG	Abtenau and Moosegg Mines	300.
Do.	Rigips Austria GmbH	Grundlsee, Puchberg, Unterkainisch, and Weisenbach Mines	250.
Do.	Knauf Gesellschaft GmbH	Hinterstein Mine	160.
Iron ore	Voest-Alpine Erzberg GmbH	Erzberg Mine at Eisenerz	3,000.
Lead	Bleiberg Bergwerks-Union AG (Metall Gesellschaft, 74%)	Smelter at Brixlegg	55.
Magnesite	Veitsch-Radex GmbH	Mines at Breitenau, Hochfilzen, Radenthein, Trieben, and Veitsch	800.
Natural gas million cubic meters	Osterreichische Aktiengesellschaft (Government 100%)	Fields in Vienna Basin	1,500.
Nitrogen, N content of ammonia	Agrolinz AG	Plant at Linz	498.
Salt	Österreichische Salinen GmbH (Invest Holding GmbH, 100%)	Mines at Bad Ischl	800.
Steel	Voest-Alpine Stahl GmbH	Plants at Donawitz and Linz	4,500.
Talc	Luzenac Naintsch AG	Mines at Lassing, Rabenwald, and Weisskirchen, and plants at Oberfeistitz and Weisskirchen	160.
Tungsten	Wolfram Bergbau und Hütten GmbH	Mittersill Mine, Felbertal, Salzburg; conversion plant at Bergla	350.

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THE MINERAL INDUSTRIES OF THE NORTHERN BALKANS

BULGARIA AND ROMANIA

By Walter G. Steblez

Bulgaria and Romania form the northeastern part of the Balkan Peninsula, which borders the Black Sea to the east, Ukraine and Moldova to the north, Greece and Turkey to the south and southeast, Macedonia and Serbia and Montenegro to the west, and Hungary to the northwest. The Danube River forms a natural boundary between Bulgaria in the south and Romania in the north. Bulgaria is encompassed within the Mediterranean Alpine folded zone, which comprises the Carpatho-Balkan branch to the north and the Dinaric-Hellenic branch to the south (Bogdanov, 1982, p. 215). The Carpatho-Balkan branch also constitutes the primary folded zone in Romania, which incorporates the eastern and southern Carpathian Mountains, and the Apuseni Mountains within the Carpathian Arc to the west of the Transylvanian Plateau (Ianovici and Borcos, 1982, p. 55-58).

Mining and metalworking in this region has a long history that was well-documented by Roman times when Bulgaria and Romania, which were known as Thrace and Dacia, respectively, were important sources of base and precious metals. Gold and nonferrous metals mined in this region have remained attractive investment opportunities to foreign investors.

BULGARIA

Bulgaria's mineral industry included the mine output of ferrous and nonferrous metals, mineral fuels (mainly coal), and such industrial minerals as clays, gypsum, and rock salt. Additionally, the metallurgical sector smelted and refined copper, gold, iron and steel, lead, silver, and zinc. Cement, dimension stone, and other construction materials also were produced. On a world scale, however, Bulgaria's mineral industry was small and mainly of regional importance. Many of the country's minerals requirements were met through domestic production. Bulgaria, however, remained dependent on imports of copper ores, iron ore, lead and zinc ores, steel, and mineral fuels.

According to the International Monetary Fund (2006§[1]), Bulgaria's gross domestic product (GDP) based on purchasing power parity amounted to about $69.1 billion; in constant dollars, the GDP grew by about 7% compared with that of 2004. Industrial production, which accounted for slightly more than 26% of the GDP, grew by about 6.7% (U.S. Central Intelligence Agency, 2006, p. 88). In 2005, the overall output value of the mining sector increased only slightly compared with that of 2004. The mining industry's branches reported a 9% decline in the output value of coal and peat mining, a very slight increase in the output value of metal ores, and a 2.7% increase in the output value of industrial mineral mining and quarrying. Processed industrial minerals and base metals recorded output (value) gains of 15.3% and 5.5%, respectively (National Statistical Institute, 2006§). Exploration for gold at Krumovgrad in the Kurdjali area and several other locations was among the leading events in the mineral industry of Bulgaria in 2005.

Government Policies and Programs

The Law on Transformation and Privatization of State and Municipal-Owned Enterprises was adopted by Parliament in 1992, and the Underground Resources Act was adopted in 1998; these laws were adopted to promote private enterprise and foreign investment. The principle of equal treatment of foreign and domestic investors was promulgated in law in the Constitution and in the Law on Encouragement of Investments (Krastanova, 2005).

Despite explicitly stipulating state ownership of underground minerals, the Underground Resources Act provides for the submission and approval procedures for permits and claims by domestic and foreign companies to develop and operate mineral deposits for up to 35 years with additional 15-year extensions. Exploration rights to private companies could be granted for up to 3 years (Kousseff, 1999, p. 41). In addition, the National Program for Sustainable Development of Mining in Bulgaria was drafted and approved in 1998. The Government continued to work to improve the country's environmental condition and began enforcement of environmental regulations that would meet European Union standards at all new mineral industry projects.

Commodity Review

Metals

Bulgaria's mine output included copper, iron, lead and zinc, and manganese. Additionally, byproduct gold, silver, molybdenum, and other metals have been produced, chiefly from the processing of copper and lead and zinc ores and concentrates. Bulgaria's production of primary aluminum shapes (ingot) was based entirely on aluminum scrap.

Aluminum.—In 2005, Alcomet AD, which was Bulgaria's producer of aluminum semimanufactures, reported substantial growth of investment and production during the 2000 to 2004 period. The production of aluminum semimanufactures amounted to 26,766 metric tons (t), which was an increase of about 13.6% compared with that of 2004 and an almost

[1]References that include a section mark (§) are found in the Internet Reference(s) Cited sections.

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4.4-fold increase compared with that of 2000. Investments in 2005 ($12,713,344) showed substantial increases of about 72% compared with those of 2004, and almost four times the investment outlays in 2000. The modernization of the company's casting and extrusion shops was the main objective of the outlays. Alumetal AD, which acquired about 74% of Alcomet in 2002, planned to invest €18 million (about US$21 million) in 2006 for environmental improvements to meet the environmental standards that are required by the European Union prior to Bulgaria's accession to that organization in 2007 (Alcomet plc, 2006; Metals Insider, 2006a).

Copper.—In 2005, Bulgaria's output of mined copper ore increased by about 3.9% compared with that of 2004; the recoverable metal in concentrate increased by about 4.7%. Total smelter and refinery output rose by about 5.7% and 15.2%, respectively, compared with corresponding levels reached in 2004 (table 1).

Bulgaria's major copper deposits were developed and exploited in the Srednogorie-Panagjurishte region of the country; three major mines were in operation—the Asarel-Medet JSC and the Elatsite AD surface mines and the Chelopech underground mine. Asarel-Medet and Elatsite were the principal producers of copper ore in Bulgaria with a combined capacity to produce 340,000 metric tons per year (t/yr) of copper concentrate. In 2005, Asarel-Medet announced plans for facility modernization worth more than $43 million that would include upgrading plant and laboratory equipment. Equipment purchases included boring equipment, mining machines, and trucks worth about $15.5 million (Asarel-Medet JSC, 2005).

In 2005, the partial divestiture of N.V. Umicore S.A. of Belgium resulted in the creation of the mainly copper-oriented Cumerio S.A., which took over the operation of the Pirdop copper smelter and refinery. The Pirdop operation, which was renamed Cumerio Med, remained the principal producer of copper in Bulgaria (UBS Investment Bank and KBC Securities, 2005, p. 1, 2, A3-7; Wood and others, 2006, p. 26-27).

The Chelopech mining operation, which was located about 70 kilometers (km) east of Sofia, worked a polymetallic deposit that contained mainly copper and associated precious metals (gold and silver). Chelopech Mine was considered to be primarily a gold producer owing to the much higher value of gold produced. The copper content of the ore averaged about 1.5%. Measured and indicated resources were reported to be about 23.9 million metric tons (Mt) of ore at a grade of 4 grams per metric ton (g/t) gold, 10 g/t silver, and 1.5% copper (about 374,000 t). Dundee Precious Metals Inc. (Dundee) of Canada, which acquired mining and exploration rights at Chelopech in 2003, continued an active exploration program for copper and gold at Chelopech and other several areas (Dundee Precious Metals Inc., 2004a, b).

Dundee's work results for 2005 at Chelopech included the completion of exploratory drilling to confirm resource evaluations, the startup of a facility expansion program to raise ore output to 2 million metric tons per year (Mt/yr), and the startup of a feasibility study to install an autoclave. During the year, Dundee also prepared and filed an environmental impact assessment (EIA). Bulgaria's Supreme Environmental Council reviewed the work favorably and voted to approve Dundee's planned mine and facility expansion project at Chelopech. In April, Dundee announced that it reached a $10 million loan agreement with the European Bank for Reconstruction and Development (EBRD) to help finance the facility expansion at Chelopech (Dundee Precious Metals Inc., 2006b). In 2005, Chelopech produced 11,168 t of copper and about 1.8 t of gold at recovery rates of 82.5% and 49.3%, respectively. Plans for the 2006-07 period at Chelopech called for the completion of the mine and facility expansion and the completion of construction of the autoclave. The resulting output of gold and copper was expected to amount to about 4 t/yr of gold and 22,000 t/yr of copper (Mining Journal, 2005c; Dundee Precious Metals Inc., 2006a, p. 3-8; 2006c).

Gold.—In 2005, gold production amounted to almost 3.9 t, which was about a 59% increase compared with that of 2004 and was based almost entirely on the year's gold output attained by Dundee at Chelopech (Dundee Precious Metals Inc., 2006a, p. 3-8). Dundee continued exploration for gold in the Krumovgrad region near Kurdjali. The prospecting concession covers 117 square kilometers (km^2) and encompasses (in an east-west arc) the Sumak, the Skalak, the Kuklitsa, the Ada Tepe, and the Kupel deposits. At yearend 2004, Dundee awarded a contract to Ausenco Ltd. of Australia for a feasibility study of the Krumovgrad mining project. The feasibility study, which was completed in mid-2005, recommended open pit mining of reserves that were estimated to total 4.86 Mt of ore at grades of 5.08 g/t gold and 2.66 g/t silver. The feasibility study set the base prices for gold and silver at US$450 per troy ounce and $6.50 per troy ounce, respectively. Total ore production during the life of the mine was to amount to about 4.8 Mt; throughput of ore was planned to be about 850,000 t/yr initially and then decline to 750,000 t/yr after the exhaustion of the upper ore zone. Processing would include conventional crushing and grinding, cyanidation, a carbon-in-leach circuit, and electrowinning to produce doré. The initial cost of the development of mining and processing facilities was estimated to be $75 million; construction was scheduled to start near Ada Tepe in mid-2006 (Dundee Precious Metals Inc., 2005, p. 2; Mining Journal, 2005d).

Cambridge Mineral Resources plc of the United Kingdom, having acquired the Balkan exploration and mining assets of Hereward Ventures plc in March, continued to explore for gold at sites that define an arc along the southeastern border with Greece and Turkey in Bulgaria, which included the Dobroselets, the Gornoseltsi, the Polski Gradets, and the Rozino exploration licenses and permit areas. In 2005, Cambridge announced the discovery of a gold deposit in the Polski Gradets permit area, near Topolovgrad. Drill core study revealed gold grades of about 2.2 g/t (Mining Journal, 2005a).

In 2005, EurOmax Resource Ltd. of Vancouver, British Columbia, Canada, continued to explore for gold and silver in the Rhodope Mountains. Exploration was conducted under the Popintsi, the Rakitovo, and the Trun licences (EurOmax Resources Ltd., 2005).

Iron and Steel.—In 2005, Bulgaria reported the cessation of iron ore (gross weight) production (table 1). Iron ore has constituted only a small proportion of the feedstock required by the iron and steel sector, and the cessation of iron ore

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production suggests the exhaustion of marketable reserves. The production of crude steel, which was based mainly on imported raw materials, varied only slightly from the output level of 2004 (table 1).

Sidenor S.A. of Greece, which was the majority stock share owner of Stomana AD (80%) continued to implement facility expansion at Stomana, which would include a rolling mill for light long-carbon-steel products and such new equipment as automation and control equipment; a billet welder; bundling, finishing, and stacking facilities; and a preheating furnace (Stomana S.A., 2006).

In 2005, Global Steel Holdings Limited (GSHL), which was a subsidiary of the Ispat Group (Mittal) of India, announced the acquisition of Finmark Ltd., which held 71% equity in the Kremikovtsi Corp. GSHL also announced its intent to allocate about $300 million during the 2006-09 period on modernization of steelmaking operations. Modernization plans originally included the installation of new 800,000-t/yr single-strand slab casters, a Corex 3000-DRI plant, and coke and sinter plants (Glasson, 2003; Sofia Echo, The, 2005).

Lead and Zinc.—The lead and zinc industry in Bulgaria was based on mining and processing operations near Plovdiv in the Ossogovo Mountains of western Bulgaria, near the Thundza River in southeastern Bulgaria, and in the Madan area near the Greek border. Lead and zinc smelting and refining operations were based in Kurdjali in the Madan area and in Plovdiv. The underground lead and zinc mining complex at Gorubso continued to be the country's major producer of lead and zinc ore.

In 2005, total mine production of lead in concentrate increased by almost 16% compared with that of 2004. This increase, however, followed a 23% production decline in 2004. The production of zinc in concentrate increased by about 13% compared with that of 2004 (table 1). Primary and secondary lead production amounted to about 81,000 t, which was almost a 29% increase compared with that of 2004. Primary and secondary zinc production, however, fell short of output in 2004 by about 6% (table 1). At yearend, Intertrust, which was a holding company registered in Bulgaria, purchased Lead and Zinc Complex (Kurdzhali), Ltd. for about $16 million. Kurdzhali reportedly posted losses throughout the first three quarters of 2005 under the Economic and Investment Bank, its previous owner (Metals Insider, 2006b).

Manganese.—In 2005, starting from a low base, Bulgaria's production of manganese (content in ore) increased by more than 43% compared with that of 2004. The Obroschishte manganese mine remained Bulgaria's sole produce of mainly carbonate type (rhodocrosite) manganese ore, which was hosted in Oligocene-age volcanic sedimentary deposits (aleurolite, clay, glauconitic sandstone, marl, and tuff). Apart from the mining operations that were engaged at the Obrochishte deposit, OreVest plc of the United Kingdom undertook exploration of a 10.4-km^2 section of the deposit, which was located about 3 kilometers (km) southeast of the Obrochishte Mine, with the aim of developing a new mine. Discussions were conducted throughout the year with the Government of Bulgaria for the acquisition of mining rights to the deposit and additional exploration licenses in the area (OreVest plc, 2006).

Industrial Minerals

Bulgaria produced a broad range of industrial minerals suitable for chemical and construction industry uses. These included barite, calcareous rock, cement, clays, lime, salt, and silica. Bentonit AD and Kaolin AD were the major producers of industrial minerals in Bulgaria. Kaolin AD operated quarries and processing facilities at Vetovo and Kaolinovo (kaolin), Shoumen and Varna (quartz-feldspathic sands), and Konarata and Ustrem (potassium and sodium feldspars). Final output included kaolin, glass sand, and dry and wet silica sands.

Bentonit AD was a major Bulgarian producer of bentonite, perlite, and zeolite. With bentonite, zeolite, and perlite resources amounting to about 7.3 Mt, 2.8 Mt, and 0.8 Mt, respectively, Bentonit AD's corresponding processing capacities were reported to be 200,000 t/yr, 50,000 t/yr, and 150,000 cubic meters per year, respectively.

In late 2004, Bulgaria reported the discovery of a diamond deposit near Kurdjali. No details were provided; however, in 2005, Bulgaria reported having exported about $5 million worth of diamond to Israel in 2004. Bulgaria's diamond exports to Israel represented about 7% of the value of total exports to Israel (OreVest plc, 2006).

In 2005, The Solvay Group installed a new distillation unit at Bulgaria's Denyva soda ash plant. The unit, which was designed to recover ammonia, cost more than $6.5 million (Industrial Minerals, 2005).

Mineral Fuels

In 2005, total coal output remained on a declining trend: output in 2005 fell short of that in 2004 by almost 6%; output in 2004 had declined by about 4% compared with that of 2003. Coal mining, which supplied about 45% of the fuel needed to generate electric power, was the predominant fossil fuel-producing sector in Bulgaria. The country's production of natural gas continued to show substantial gains in 2005 compared with those of 2004 as offshore natural gas producing capacities continued to come onstream (table 1); petroleum production, however, was small; it ranged between 27,000 t and 33,000 t in the 2001 to 2005 period. During the year, discussions were held among various international participants concerning the construction of several oil pipeline projects that would alleviate daily oil tanker congestion in the Bosporus (Vatahov, 2005). In midyear, the EBRD announced plans to loan about $510 million to Bulgaria's Maritza East I Power Station to construct a 600-megawatt lignite-powered unit. In part, this project was designed to offset anticipated shortfalls of electricity production from the planned closure of the Kozloduy nuclear powerplant. The EBRD indicated that the unit's clean coal technology would keep emissions at the plant well within the European Union's environmental standards (Mining Journal, 2005b).

Outlook

Bulgaria's application to join the European Union carries a broad range of requirements, which include modernization of

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industrial plant and infrastructure. To meet these requirements, Bulgaria is expected to continue to develop its industrial minerals sector, especially quarries and processing facilities for the production of construction materials. Exploration for precious metals also is expected to expand.

References Cited

Alcomet plc, 2006, Investments: Shumen, Bulgaria, Alcomet plc press release, August 19, 1 p.

Asarel-Medet JSC, 2005, (untitled): Panagyurishte, Bulgaria, Asarel-Medet JSC press release, August 18, 1 p.

Bogdanov, B., 1982, Bulgaria, *in* Mineral deposits of Europe—Southeast Europe: London, United Kingdom, The Institute of Mining and Metallurgy and the Mineralogical Society, p. 215.

Dundee Precious Metals Inc., 2004a, Dundee Precious Metals Inc.—Progress report on Bulgarian activities: Toronto, Ontario, Canada, Dundee Precious Metals Inc. press release, September 17, 3 p.

Dundee Precious Metals Inc., 2004b, Dundee Precious settles remaining obligations on purchase of Bulgarian mining assets from Navan: Toronto, Ontario, Canada, Dundee Precious Metals Inc. press release, January 10, 2 p.

Dundee Precious Metals Inc., 2005, Krumovgrad gold project feasibility study completed indicating low cash costs, 1.9 year after tax payback and gold annual production of 150,000 oz per year for first four years: Toronto, Ontario, Canada, Dundee Precious Metals Inc., July 5, 4 p.

Dundee Precious Metals Inc., 2006a, Management discussion and analysis, *in* Annual report 2005: Toronto, Ontario, Canada, Dundee Precious Metals Inc., March, 71 p.

Dundee Precious Metals Inc., 2006b, Strong financial and operational results: Toronto, Ontario, Canada, Dundee Precious Metals Inc. press release, March 10, 2 p.

Dundee Precious Metals, Inc., 2006c, The next mid-cap gold producer: Toronto, Ontario, Canada, Dundee Precious Metals Inc. brochure, 8 p.

EurOmax Resources Ltd., 2005, Popintsi gold project update: Vancouver, British Columbia, Canada, EurOmax Ltd. press release, September 21, 3 p.

Glasson, Victoria, 2003, Kremikovtzi announces €240 million switch to Corex: Metal Bulletin, no. 8820, July 24, p. 14.

Industrial Minerals, 2005, Solvay upgrades Bulgaria facility: London, United Kingdom, Industrial Minerals, no. 459, December, p. 15.

Kousseff, Vladimir, 1999, Bulgaria: Mining Journal Mining Annual Review Supplement, v. 332, no. 8537, June 25, p. 41.

Krastanova, Nadejda, 2005, Bulgaria—Foreign investments legislation: Milan, Italy, Studio Legale Sutti press release, July 14, 3 p.

Metals Insider, 2006a, Bulgaria's Alcomet becomes one of top twenty local companies: London, United Kingdom, Sucden, January 11, p. 3.

Metals Insider, 2006b, Bulgaria's Intertrust takes controlling stake in local zinc-lead smelter: London, United Kingdom, Sucden, January 4, p. 19.

Mining Journal, 2005a, Bulgarian find: London, United Kingdom, Mining Communications Ltd., June 17, p. 9.

Mining Journal, 2005b, Bulgarian lignite funds: London, United Kingdom, Mining Communications Ltd., May 27, p. 3.

Mining Journal, 2005c, Chelopech boost: London, United Kingdom, Mining Communications Ltd., December 16, p. 3

Mining Journal, 2005d, Dundee receives Krumovgrad study: London United Kingdom, Mining Communications Ltd., July 8, p. 9.

OreVest plc, 2006, OreVest plc quarterly statement to 31 December 2005: London, United Kingdom, OreVest plc press release, March 26, 2 p.

Sofia Echo, The, 2005, Forbes's top ranker buys Kremikovtsi: Sofia, Bulgaria, The Sofia Echo, March 27, 1 p.

Stomana S.A., 2006, Stomana II: Pernik, Bulgaria, Stomana S.A. press release, June 15, 3 p.

UBS Investment Bank and KBC Securities, 2005, Scission partielle de Umicore NV/SA—Inscription au marche reglemente d Euronext Brussels de l'ensemble des actions et des strips VVPR Cumerio emettre suite a la scission partielle: Brussels, Belgium, UBS Investment Bank March 29, 157 p.

U.S. Central Intelligence Agency, 2006, World factbook 2006: Washington, DC, U.S. Central Intelligence Agency, January 1, 709 p.

Vatahov, Ivan, 2005, Pipeline maneuvers: Sofia, Bulgaria, The Sofia Echo, March 20, 2 p.

Wood, Eve, Owen, Mark, and Thompson, Cathy, 2006, Metal producers of the world: London, United Kingdom, Metal Bulletin plc, 318 p.

Internet References Cited

International Monetary Fund, 2006 (September), Bulgaria, World Economic Outlook Database, accessed September 1, 2006, via URL http://www.imforg/external/pubs/ft/weo/2005/62/data/dbgim.cfm.

National Statistical Institute, 2006, Untitled, accessed December 7, 2006, at URL http://www.nsi.bg/Index_e.htm.

ROMANIA

Romania's production of metals (aluminum, copper, lead and zinc, manganese, and steel and ferroalloys), industrial minerals, and mineral fuels was mainly of regional importance. Compared with 2004, major production gains in the metals sector in 2005 included those for alumina (23%) and primary aluminum (10%). Analogously, production shortfalls centered mainly on primary refined copper (15%) and crude steel (7%). Cement production increased by about 13% compared with that of 2004; marketable kaolin and bentonite production declined by about 9% and 2%, respectively (table 3). Total coal output declined slightly; the natural gas and petroleum output declined by about 6% and about 5%, respectively.

In 2005, Romania's real gross domestic product (GDP) increased by 5% compared with that of 2004; the GDP based on purchasing power parity (current prices) amounted to about $177 million (International Monetary Fund, 2006§). Industrial production increased by about 2.5% (U.S. Central Intelligence Agency, 2006, p. 460). The Government of Romania continued to develop policies that were aimed at reforming the industrial sector to raise competitiveness in preparation for privatization and entry into the European Union and to abate pollution from mine-based point sources.

Government Policies and Programs

Certain policies that were promulgated in 2004 remained in effect in 2005; these included giving greater impetus to the reformation of Romania's mining industry. A published plan to streamline the mining sector called for the closures of mines that produced fuel and nonfuel minerals. Romania's requirements for accession to the European Union stimulated the Government to develop these plans in an effort to reduce and/or eliminate mining sector subsidies, which in 2004 amounted to about $150 million. In April 2005, the Government adopted the 2004-2010 Mining Sector Strategy (MSS), which planned to eliminate all subsidies to metal and industrial mineral mining operations by 2007; subsidies to coal mining enterprises were to be eliminated by 2010 (World Bank, The, 2004, p. 1).

The MSS set short-, medium-, and long-term phases to implement the reforms. In the short term (yearend 2004), regulations were developed to convert the mining industry to a full market-based system from remaining aspects of central economic planning; these regulations stipulated transparency and accountability on the parts of the mining sector. In the medium-term phase (2005-06), the Government was to restructure the parts of the mining sector that were scheduled for closure and allocate their financial resources and assets to more profitable mining enterprises that were to be privatized. The medium-term phase also was to include the organization

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of oversight agencies to supervise mine site reclamation and environmental rehabilitation. The long-term phase (2006-10) would implement the full elimination of state subsidies to the mining industry and the closure of up to 31 uneconomic mining operations (World Bank, The, 2004, p. 26). Additionally, in 2005, environmental issues arose that were associated with a remediation project at the Vermasti Mine, which had produced brown coal until its closure in 1997. The project was funded by a $45 million loan (issued on August 31, 1999) from the International Bank for Reconstruction and Development. These issues included claims that the reclamation project at Vermesti did not adequately assess environmental degradation in the lands surrounding the mine and increased the possibility of flooding in the region (International Bank for Reconstruction and Development, 2006).

The metal mining and processing operations identified for closure by MSS included the following enterprises: Balan Central Mine (underground copper ore extraction), Harghita County; Borsa Beneficiation Plant (treatment of copper, gold, and silver ore), Maramures County; Burloia Central Gura Baii Superior (underground copper, lead, and zinc ore extraction), Maramures County; Buturuosa Baia de Aries Mine (underground copper, gold, and silver ore extraction), Alba County; Fagu Cetatii Mine (underground copper ore extraction), Harghita County; Poiana Orizont 110 Mine (underground copper ore extraction), Harghita County; and the Santimbru Mine (open pit extraction of mercury ore), Harghita County.

Among industrial minerals mining enterprises, MSS designated the Calamani Negoiu Mine in Suceava County for closure; the mine extracted sulfur by open pit and underground method. The closure of bituminous coal mining and processing facilities in Hunedoara County included the Aninoasa Mine (underground), the Balomir Mine (open pit), the Iscroni-Livenzi Sud Mine (underground), the Uricani 5 Est Mine (underground), and the Valea de Brazi Mine (underground). Beneficiation plants for bituminous coal in Hunedoara County that were designated for closure included the Lupeni, the Petrila, and the Uricana plants. Lignite mines slated for closure included the Bodos Mine (open pit), Covasna County; the Budoi Mine and Briqueting Plant (underground), Bihor County; and the Racos Put Mine and Briqueting Plant (underground), Covasna County (World Bank, The, 2004, p. 36-47).

Commodity Review

Metals

Aluminum.—In 2005, total aluminum production increased by about 9.6% compared with that of 2004. The increase in alumina production was attributable to uninterrupted operations of Alum S.A. (Alum) in 2005 and facility modernization to bring production capacity to 800,000 metric tons (t) (International Bank for Reconstruction and Development, 2006). In September, Romania's primary aluminum producer, SC Alro S.A. (Alro), announced the acquisition of a majority stake in Alum. Alro indicated that investment for the modernizing of Alum would continue (International Bank for Reconstruction and Development, 2006).

At yearend, Alro announced an investment program that would allocate $500 million during the 2006-10 period to raise the aluminum smelter's annual production capacity to 429,000 t from 270,000 t in 2005. During the preceding 3-year period, Alro had invested about $145 million to modernize production facilities and introduce pollution-reducing technologies (Reuters, 2005b; Metals Insider, 2006).

Copper.—Copper was mined in the northeastern part of the country (mainly at the Baia Sprie, the Cavnic, and the Lesul Ursului Mines), and in the southwestern part of the country (major mines at Moldova Noua, Rosia Poieni, and Rosia Montana). Generally, such major producing mines as Moldova Noua and Rosia Poieni were hoisting ore that graded about 0.35% copper or less. Concentrates from these areas were smelted and refined at Baia Mare and Zlatna. At Baia Mare, SC Allied Deals Phoenix SA operated an Outokumpu flash smelter, an electrolytic copper refinery, and a continuous caster. At Zlatna, SC Ampelum SA processed copper concentrates and operated a smelter and an electrolytic refinery (Moreno, 2000, p. 57).

In 2005, Romania's output of copper in concentrate declined by about 20% compared with that of 2004. The production of total refined copper decreased by about 14% (table 3).

Gold.—European Goldfields Ltd. continued exploration and evaluation work at Certej. Measured gold resources at the Certej deposit were estimated to be about 3.14 million metric tons (Mt) of ore at grades that averaged 2.6 grams per metric ton (g/t) gold and 5 g/t silver. Indicated resources were estimated to be about 28.3 Mt of ore at grades of 2.1 g/t gold and 12 g/t silver. Inferred resources were estimated to be 8.64 Mt of ore at grades of 1.8 g/t gold and 7.9 g/t silver. In 2004, the company began a prefeasibility study of the Certej deposit; the study was completed in 2005 (European Goldfields Ltd., 2005, p. 10; 2006b). The prefeasibility study confirmed that the Certej ore was suitable for concentrate production that would have grades of 18 to 20 g/t gold and up to 100 g/t silver (European Goldfields Ltd., 2006a). The first part of the environmental impact assessment (EIA) was completed in 2005; work in progress during the year included work on the second part of the EIA, metallurgical process studies, mine design work, and work to determine reserves (European Goldfields Ltd., 2006b). Preliminary assessments indicated that the quantity and quality of Certej's ore warranted the development of an open pit mine to work the deposit (European Goldfields Ltd., 2004). European Goldfields' yearend results show deferred exploration and development costs of all activities in Romania to have amounted to more than $3.9 million, of which Certej amounted to $2.38 million, or about 61% of the total cost (European Goldfields Ltd., 2006c).

Preparatory work for modern mining operations by Gabriel Resources Ltd. of Canada at the Rosia Montana gold deposit progressed in 2005; it included the finalization of environmental permitting documentation and detailed engineering plans for the new mine that were scheduled for submission to the Government during the first quarter of 2006. According to Gabriel spokespersons, gold production could start in late 2008 or early 2009; at full capacity, the mine could produce up to 15,600 kilograms per year (kg/yr) of gold. Rosia Montana quartz-vein ore hosts electrum as the main gold mineral

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(Reuters, 2005a; Manske and others, 2006). Issues that impeded rapid development of the Rosia Montana project and needed resolution included regional environmental protection; local social concerns, which included minimizing resettlement; and the protection of historical and archaeological sites (Richards, 2005).

In addition to the work undertaken at Rosia Montana, Gabriel continued exploration of the Frasin and the Radu deposits in the Bucium exploration license area (Gabriel Resources Ltd., 2007; Mining Journal, 2005c). In early 2005, Gabriel reported new resource estimates for its licensed properties in the Bucium area. At Radu, inferred resources were estimated to be 26.1 Mt of ore at grades 0.97 g/t gold and 2 g/t silver. At Frasin, indicated reserves were estimated to be 7.94 Mt of ore at grades of 1.91 g/t gold and 5 g/t silver and inferred reserves were estimated to be 9.28 Mt of ore at grades of 1.7 g/t gold and 5 g/t silver (Mining Journal, 2005b, c).

Carpathian Gold Inc. of Toronto, Ontario, Canada, actively conducted exploration for gold under license in the Apuseni Mountains (Golden Quadrilateral); at the Colnic gold/copper porphyry deposit near Rovina; at Baia Mare in the northwest in the contiguous Firiza-Rotunda and Rotunda-Varatec area [in a joint venture with Romania's state-owned REMIN S.A. mining company (quartz-vein-type ore)]; and at the Oravita license at Banat in southwestern Romania (gold/copper porphyry) (Carpathian Gold Inc., 2005a-c; Mining Journal, 2005a).

Iron and Steel.—Steel output in 2005 declined by about 7% compared with that of 2004, which is comparable to the production level reached in 2003; pig iron production fell by about 3% (table 3). Major events in the steel industry included negotiations between Ispat Sidex SA Galati's owner, Mittal Steel Co. NV (United Kingdom), and the Government of Ukraine for the delivery of iron ore feedstock to Ispat Sidex. Mittal considered a possible investment of $300 million to revamp the stalled Krivoi Rog iron ore mining operation in Ukraine. Domestic iron ore production represented only a small and declining fraction of the raw material requirement for Romania's steel industry; most iron ores and concentrates were imported. Mittal Steel also reported the acquisition of an 89% share in the Romportmet port facility in Galati to improve shipments to and from its steelmaking operation there (Metals Insider, 2005; Mining Journal, 2005d). In 2005, Mechel Steel Group of Russia acquired additional shares ($5.9 million) in the COST SA Targoviste Steel Mill, which raised Mechel's ownership by about 2.7% to 83.66%. In early 2005, Mechel announced corporate name changes to its facilities in Romania: SC Industrie Sarmei SA was renamed Mechel Campii Turzii and COST SA Targoviste became Mechel Targoviste (Mechel Steel Group, 2005; Reuters, 2005c).

Lead and Zinc.—Relatively low-grade lead and zinc ores were produced at underground mines in the Baia Mare, the Borsa, the Certej, and the Rodna districts; the ores graded between 0.4% lead and 0.6% zinc and 1.0% lead and 1.2% zinc. Romania's lead and zinc ores also contained copper (0.35%), and associated antimony, bismuth, cadmium, gold, and silver. Because of the complex mineralogy of the lead and zinc ores, concentrates produced from them have varied widely with respect to metal content. Metal recovery from concentrates has ranged from 50% to 75% for lead and zinc. Smelting and refining of lead and zinc from domestic and imported ores and concentrates was carried out at the Sometra S.A.'s Imperial smelter at Copsa Mica. In 2005, reported mine production of lead and zinc (in concentrate) continued to decline, falling by 37% and 42%, respectively, compared with production levels reached in 2004 (table 3). The output of refined lead was slightly greater than that in 2004; zinc metal production declined by about 6% compared with that of 2004 (table 3).

Industrial Minerals

Romania was known to have a broad range of industrial minerals that included barite, various calcareous rocks, clays, granitic/pegmatitic sources of feldspar and mica, graphite, gypsum, salt, and silica-group minerals. Seven privately owned companies and one state-owned company were involved in the mining and quarrying of industrial minerals. The modernization of the country's economy and infrastructure was expected to increase the domestic demand for industrial minerals and construction materials. In 2005, the production of cement increased by about 13% compared with that of 2004.

Mineral Fuels

The petroleum and refining industries historically have been among Romania's leading industrial sectors. Although small by world standards, the petroleum industry continued to be an important factor in the country's energy balance. Estimates of petroleum resources have ranged from 1.0 billion to 1.6 billion metric tons (Gt). The extraction of crude petroleum in recent years, however, has exhibited a declining trend. From 1997 through 2005, inclusive, petroleum output declined each year by about 2%, 3%, 2%, 2%, 1%, 3%, 3%, 3%, and 5%, respectively, compared with the preceding year (table 3). The output of natural gas has shown a similar declining trend in production. Lignite accounted for almost 100% of total coal produced in Romania in 2005.

Outlook

Romania's application to join the European Union carries a broad range of requirements, which include modernization of industrial plant and infrastructure. To meet these requirements, Romania is expected to continue to develop its industrial minerals sector, including quarries and processing facilities for the production of construction materials. As in Bulgaria, gold exploration is expected to continue to be an important aspect of foreign investment in the country's mineral industry.

References Cited

Carpathian Gold Inc., 2005a, Carpathian Gold Inc. completes RC drill program and intersects copper mineralization including 14 metres at 0.85% Cu at the Talva Mica prospect, Oravita License, Romania: Toronto, Ontario, Canada, Carpathian Gold Inc. press release, December 20, 3 p.

Carpathian Gold Inc., 2005b, Carpathian Gold intersects several high-grade gold zones on its Northern Romanian Exploration licenses: Toronto, Ontario, Canada, Carpathian Gold Inc. press release, October 27, 2 p.

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Carpathian Gold Inc., 2005c, Carpathian Gold Inc. now drilling a porphyry Au and porphyry Cu + Au system on the Rovina license, central Romania: Toronto, Ontario, Canada, Carpathian Gold Inc. press release, February 7, 3 p.

European Goldfields Ltd., 2004, Results for the third quarter 2004—Pursuing growth strategy—Acquisition of three deposits in Greece and good drilling results in Romania: Whitehorse, Yukon, Canada, European Goldfields Ltd. press release, November 11, 9 p.

European Goldfields Ltd., 2005, Annual report 2004: Toronto, Ontario, Canada, European Goldfields Ltd., 68 p.

European Goldfields Ltd., 2006a, Certej pre-feasibility study highlights opportunities: Whitehorse, Yukon, Canada, European Goldfields Ltd. press release, July 5, 3 p.

European Goldfields Ltd., 2006b, Certej project moving forward: Whitehorse, Yukon, Canada, European Goldfields Ltd. press release, January 25, 4 p.

European Goldfields Ltd., 2006c, European Goldfields—Results for 2005: Whitehorse, Yukon, Canada, European Goldfields Ltd. press release, March 29, 15 p.

Gabriel Resources Ltd., 2007, Technical report—Rosia Montana: Toronto, Ontario, Canada, January 26, 12 p.

Ianovici, V. and Borcos, M.., 1982, Romania, *in* Mineral deposits of Europe—Southeast Europe: London, United Kingdom, The Institute of Mining and Metallurgy and the Mineralogical Society, p. 55-57.

International Bank for Reconstruction and Development, 2006, Request for inspection—Romania—Mine closure and social mitigation project report and recommendation: Washington, DC, World Bank Group, no. INSP/R2006-0003, March 22, p. 1-12.

Manske, S.L, Hendequist, J.W., O'Connor, Gary, Tamas, Calin, Cauuet, Beatrice, Leary, Steven, and Minut, Adrian, 2006, Rosia Montana, Romania—Europe's largest gold deposit, *in* SEG newsletter: Littleton, Colorado, Society of Economic Geologists, no. 64, January, p. 11-14.

Mechel Steel Group, 2005, Mechel announces change in names of its Romanian subsidiaries: Moscow, Russia, Mechel Steel Group press release, February 22, 1 p.

Metals Insider, 2005, PLATTS-Mittal Steel acquires 89% in Romanian Romportmet Port: London, United Kingdom, September 9, p. 14.

Metals Insider, 2006, Romania's Alro Slatina lifts primary output 11%: United Kingdom, Metals Insider, January 13, p. 6.

Mining Journal, 2005a, Carpathian gold focuses on Romania: London, United Kingdom, Mining Communications Ltd., May 13, p. 10.

Mining Journal, 2005b, Romania resources rise: London, United Kingdom, Mining Communications Ltd., February 25, p. 11.

Mining Journal, 2005c, Rosia Montana hitch: London United Kingdom, Mining Communication Ltd., July 8, p. 9.

Mining Journal, 2005d, Krivoi Rog iron-ore revival?: London, United Kingdom, Mining Communications Ltd., April 29, p. 10.

Moreno, Anne-Marie, ed., 2000, Non-ferrous metal works of the world (9th ed): London, United Kingdom, Metal Bulletin Books Ltd., 762 p.

Reuters, 2005a, Gabriel sees Romania gold mine in 2008/09: London, United Kingdom, Reuters press release, November 15, 2 p.

Reuters, 2005b, Romania's Alro to invest $500 mln over five years: London, United Kingdom, Reuters press release, December 19, 2 p.

Reuters, 2005c, Russia's Mechel raises stake in Romanian steel firm: London, United Kingdom, Reuters press release, December 14, 2 p

Richards, Jeremy, 2005, Rosia Montana gold controversy, *in* Mining environmental management: London, United Kingdom, Mining Communications Ltd., p. 5-13.

U.S. Central Intelligence Agency, 2006, World factbook 2006: Washington, DC, U.S. Central Intelligence Agency, January 1, 709 p.

World Bank, The, 2004, Project appraisal on proposed loan in the amount of US$120 million equivalent to Romania for a mine closure, environmental and socio-economic regeneration project: Washington, DC, The World Bank, report no. 30517-RO, November 18, 85 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Romania, World Economic Outlook Database, accessed September 1, 2006,, via URL http://www.imforg/external/pubs/ft/weo/2006/62/data/dbgim.cfm.

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TABLE 1
BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum, metal, secondary		2,000	2,000	2,000	2,000 e	2,000
Bismuth, metal e	thousand metric tons	40	40	40	30	30
Cadmium, metal, smelter		333	345	307	356	350
Copper:						
Ore:						
Gross weight	thousand metric tons	24,878	26,030	26,415	23,879	24,807
Cu content e	do.	115	112	116	107 [3]	112
Concentrate:						
Gross weight	do.	438	464	458	398	470
Cu content	do.	88	93	92	80	94
Metal, primary and secondary:						
Smelter		157,000	181,000	215,300	227,100	240,100
Refined, electrolytically		34,400	40,000 r	42,000	52,500	60,500
Gold, metal	kilograms	2,540	2,612 r	2,142	2,431	3,868
Iron and steel:						
Iron ore:						
Gross weight	thousand metric tons	325	373	466	83	--
Fe content	do.	92	105 e	127	27	--
Iron concentrates	do.	240	167	248	52 e	--
Metal:						
Pig iron for steelmaking	do.	1,211	1,072	1,386	1,200	1,200
Ferroalloys, ferrosilicon e	do.	10	10	10	10	10
Steel, crude	do.	1,942	1,860	1,950	2,106	2,000
Semimanufactures, rolled	do.	1,598 r	1,539 r	1,500	1,500 e	1,500
Lead:						
Mine output, Pb content		16,000	24,000	31,000	25,000	32,000
Concentrate:						
Gross weight		26,400	31,108	35,200	29,900	31,500
Pb content e		18,500	21,800	24,600	19,000	22,000
Metal, refined, primary and secondary		88,300	66,000	66,000	63,000	81,000
Manganese ore:						
Gross weight		1,516	4,000 r	4,000	28,000	39,000
Mn content e		450	1,100 r	1,100	7,600	10,900
Silver, mine output, Ag content		57	60	50	60	60
Tin, metal e		10	10	10	10	10
Uranium oxide, U content e		600	600	600	600	600
Zinc:						
Mine output, Zn content e		10,600	25,800	31,000	19,000	22,000
Concentrate:						
Gross weight		23,301	28,672	26,000	29,900	33,700
Zn content e		12,100	14,900	18,800	15,500	17,500
Metal, smelter, primary and secondary		88,600	83,000	86,800	101,500	95,100
INDUSTRIAL MINERALS						
Asbestos, fiber, all grades e		300	300	300	237	--
Barite ore, run-of-mine		825,000	656,000	637,000	237,000 e	230,000
Cement, hydraulic	thousand metric tons	2,088	2,137	2,100	2,100	2,100
Clays:						
Bentonite	do.	320	212	146	225	181
Kaolin, raw	do.	959	1,026	1,137	1,291	1,381
Refractory	do.	37	38	40	30	30
Feldspar	do.	23	34	4	5	5
Fluorspar e	do.	2	2	2	2	2
Gypsum and anhydrite:						
Crude	do.	167	156	168	176	188
Calcined e	do.	50	50	50	60	65

See footnotes at end of table.

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TABLE 1--Continued
BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Lime, industrial	thousand metric tons	1,248	1,156	1,500	1,500	1,500
Limestone and dolomite[e]	do.	11,000	11,000	11,000	11,000	11,000
Nitrogen, N content of ammonia	do.	580	328	321	320	320
Perlite	do.	12	11	17	8	15
Pyrites, gross weight[e]	do.	150	150	150	150	150
Salt, all types	do.	1,931	1,800	1,882	1,900	1,900
Sand and gravel	thousand cubic meters	2,375	2,385	2,098	3,333	3,628
Silica, quartz sand	thousand metric tons	677	607	412	545	583
Sodium carbonate, calcined[e]	do.	800	800	800	800	800
Sulfur:[e]						
S content of pyrites		30,000 r	30,000 r	30,000	25,000	25,000
Byproduct		203,000 r	245,000 r	289,000	301,000	300,000
Total		233,000 r	275,000 r	319,000	326,000	325,000
Sulfuric acid		620,315	751,018	750,000	750,000 e	750,000
Zeolite		15,000	15,000	15,000	15,000	15,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	14	13	9	--	--
Bituminous	do.	101	109	44	170	96
Brown	do.	3,151	3,232	3,044	3,071	2,620
Lignite	do.	23,856	23,202	24,597	23,385	22,193
Total	do.	27,122	26,556	27,694	26,626	24,909
Coke[e]	do.	1,200	1,200	1,200	1,200	1,200
Natural gas, marketed	million cubic meters	22	11	11	333	537
Petroleum:						
Crude, reported	thousand metric tons	32	33	27	30	27
Refinery products[e]	thousand 42-gallon barrels	25,000	25,000	25,000	25,000	25,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data availabel through January 2007.

[2]In addition to the commodities listed, chromite, magnesite, palladium, platinum, tellurium, uranium, and a variety of crude construction materials (common clays, dimension stone, and crushed stone) are produced, but available information is inadequate make reliable estimates of output.

[3]Reported figure.

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TABLE 2
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Bentonite, mine output	Bentonite AD	Kardjali	280.
Cement	Reka Devnia	Devnia	1,825.
Do.	Zlatna Panega	Panega	1,300.
Do.	Others	Temelkovo, Dimitrovgrad, Pleven, and Beli Izvor	1,590.
Coal:			
Bituminous	Economic Mining and Power Combine (SMEK) Balkanbass	Balkan coal basin in central Bulgaria, northwest of Silven	445.
Brown	G. Dimitrov	Pernik coal basin, southwest of Sofia	4,000.
Do.	Others	Bobov Dol and Pirin in western Bulgaria	3,100.
Lignite	SMEK East Maritsa	East Maritsa coal basin near Zagora	25,000.
Do.	Others	Marbas, Pernik, and Bobov Dol coal basins	5,300.
Copper:			
Concentrate, Cu content	Asarel-Medet AD	Panagurishte, Pazardzhik District	55.
Do.	Chelopech Ltd.	Srednogorie, Sofia District	10.
Do.	Bradtze	Malko Turnovo	2.
Do.	Elatzite-Med Ltd.	Srednogorie, Sofia District	20.
Do.	Rosen	Burgas, near the Black Sea	1.
Do.	Tsar Asen	Srednogorie, Sofia District	2.
Do.	Burgaskii Mines Ltd., Zidorovo	Burgas, near the Black Sea	0.5.
Metal, smelter	Cumerio Med S.A. (Pirdop)	Srednogorie, Sofia District	150.
Metal, refined	do.	do.	30.
Iron ore	Kremikovtzi Iron and Steel Works	Kremikovtzi	2,000.
Kaolin, mine output	Kaolin AD	Senovo, Rousse District	250.
Lead-zinc:			
Concentrate, Pb-Zn content	Gorubso Co.	Erma Reka, Kurdjali, Laki, and Rudozem, all in Madan area near Greek border	59 lead, 47 zinc.
Do.	Madzharovo Ltd.	Near Plovdiv	3 lead, 2 zinc.
Do.	Ossogovo Ltd.	Ossogovo Mountains, western Bulgaria	3 lead, 2 zinc.
Do.	Ustrem Ltd.	Near Thundza River, eastern Bulgaria	3.5 lead, 0.8 zinc.
Metal:			
Pb, refined	KCM SA [formerly Dimitur Blagoev]	Plovdiv	44.
Do.	Lead and Zinc Complex Ltd.	Kurdjali	60.
Zn, smelter	KCM SA [formerly Dimitur Blagoev]	Plovdiv	60.
Do.	Lead and Zinc Complex, Ltd.	Kurdjali	30.
Manganese ore	Mangan Ltd. (Obrotchishte)	Varna District	50.
Natural gas	Ministry of Power Supply	Chiren field, in northwest Bulgaria	(1)
Perlite, mine output	Bentonite AD	Kardjali	30.
Petroleum:			
Crude	do.	do.	(1)
Refined 42-gallon barrels per day	Economic Trust for Petroleum Products	Refineries in Burgas, Pleven, and Ruse	260,000.
Steel, crude	Kremikovtzi Iron and Steel Works	Near Sofia	2,300
Do.	Stomana Iron and Steel Works	Pernik	1,300.
Zeolite, mine output	Bentonite AD	Kardjali	15.

[1]Insignificant capacity.

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TABLE 3
ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Alumina, calcined, gross weight		319,403	361,407	332,852	559,307	688,829
Ingot including alloys:						
Primary		181,831	187,052	196,844	222,347 r	243,605
Secondary		682	3,308	7,892	6,506 r	7,109
Total		182,513	190,360	204,736	228,853 r	250,714
Bismuth, mine output, Bi content e		40	40	40	40	40
Copper:						
Mine output, Cu content of concentrate		19,185	18,962	23,389	20,380 r	14,868
Metal:						
Smelter:						
Primary		8,979	8,871	4,456	61	--
Secondary e		2,000	2,000	500	10	10
Total		10,979	10,871	4,956	71	10
Refined:						
Primary		18,522	11,453	16,739	24,526 r	20,739
Secondary e		4,000	2,000	2,000	2,000	2,000
Total		22,522	13,453	18,739	26,526 r	22,739
Gold, mine output, Au content e	kilograms	500	500	400	400	400
Iron and steel:						
Iron ore:						
Gross weight	thousand metric tons	292	342	304	275	265
Metal content	do.	76	89	82	74	69
Metal:						
Pig iron	do.	3,243	3,979	4,101	4,244	4,098
Ferroalloys, electric furnace:						
Ferrosilicon		5,823	--	--	--	--
Ferromanganese		384	--	--	191 r	18,625
Ferrosilicomanganese		71,921	84,720	141,899	194,754 r	100,957
Silicon metal e		200	200	100	--	--
Total		78,328	84,920	141,999	194,945 r	119,582
Steel, crude	thousand metric tons	4,936	5,491	5,692	6,077 r	5,632
Semimanufactures:						
Pipes and tubes	do.	665	562	453	486 r	396
Rolled products	do.	3,582	3,907	4,757	5,191 r	5,196
Lead:						
Mine output, Pb content of concentrate		19,676	15,136	15,747	18,297 r	11,610
Smelter, primary e		15,000	15,000	16,000	19,000 r	12,000
Refined: e						
Primary		24,000	23,100	23,100 3	32,590 r, 3	32,903 3
Secondary		3,000	3,000	5,000	5,000	5,000
Total		27,000	26,100	28,100	37,590 r, 3	37,903 3
Manganese:						
Ore, gross weight	thousand metric tons	70	60 e	90	95	95
Concentrate: 4						
Gross weight e	do.	55	40	60	65	65
Mn content	do.	14	12	15	16	14
Silver, mine output, Ag content		12	15 e	18	18 e	15
Zinc:						
Mine output, Zn content of concentrate		29,786	21,250	22,081	23,599 r	13,784
Metal, smelter, primary and secondary		47,200	51,600	48,000	52,746 r	49,447
INDUSTRIAL MINERALS						
Barite, processed		2,851	100	23	--	--
Cement, hydraulic	thousand metric tons	5,668	5,680	5,992	6,239 r	7,032

See footnotes at end of table.

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TABLE 3--Continued
ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Clays:						
Bentonite:						
Run of mine[e]		60,000	40,000	40,000	40,000	40,000
Marketable		24,779	15,389	17,637	18,161	17,890
Kaolin:						
Run of mine[e]		70,000	71,000	70,000	70,000	65,000
Marketable		21,867	22,517	21,724	22,337	20,266
Diatomite		9,743	20,922	33,296	20,626 r	1,017
Feldspar		43,037	51,959	72,827	60,924 r	56,817
Fluorspar[e]		15,000	15,000	15,000	15,000	15,000
Graphite		1,176	1,001	1,014	395	478
Gypsum	thousand metric tons	275	421	410	490 r	502
Lime	do.	1,790	1,918	1,936	1,978 r	1,916
Nitrogen, N content of ammonia	do.	949	930	1,180	1,182 r	2,107
Pyrites, gross weight[e]	do.	70	70	70	70	70
Salt:						
Rock	do.	49	46	47	43	46
Other	do.	2,176	2,211	2,370	2,357 r	2,374
Total	do.	2,225	2,257	2,417	2,400 r	2,420
Sand and gravel	do.	733	761	3,061	3,900 r	2,421
Sodium compounds, n.e.s.:						
Caustic soda	do.	346	343	382	414	443
Soda ash, manufactured, 100% Na_2CO_2 basis	do.	448	454	407	402 r	347
Sulfur:						
S conent of pyrites	do.	2	--	--	--	--
Byproduct, all sources[e]	do.	200	200	200	200	200
Total	do.	202	200 e	200 e	200 e	200 e
Sulfuric acid	do.	58	58	65	28	11
Talc		7,270	7,310	10,082	9,725	6,760
MINERAL FUELS AND RELATED MATERIALS						
Carbon black		15,538	8,106	2,000	2,000	2,000
Coal, washed:						
Anthracite and bituminous	thousand metric tons	14	13	10	1	--
Of which, for coke and semicoke production[5]	do.	14	13	10	1	--
Brown		324	245	240	112	52
Lignite	thousand metric tons	32,457	30,154	32,813	31,479	31,070
Total	do.	32,795	30,412	33,063	31,592	31,122
Coke:						
Metallurgical	do.	1,343	1,680	1,550	1,573	1,777
Other	do.	70	186	88	--	--
Total	do.	1,413	1,866	1,638	1,573	1,777
Gas, natural, gross:						
Associated	million cubic meters	1,424	1,403	1,345	1,267	1,220
Nonassociated	do.	12,666	12,244	11,829	12,023	11,252
Total	do.	14,090	13,647	13,174	13,290	12,472
Petroleum:						
Crude:						
As reported	thousand metric tons	6,011	5,810	5,651	5,465	5,212
Converted	thousand 42-gallon barrels	45,100	44,000	42,500 e	41,000	40,000
Refinery products[e]	do.	75,000	75,000	75,000	75,000	70,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, antimony, asbestos, and a variety of construction materials are produced, and molybdenum may have been produced as a byproduct of copper from 1988 on; output is not reported quantitatively and available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Estimated series are based on published data for concentrate production.

[5]To avoid double counting, data not included in total coal production.

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TABLE 4
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity
Alumina	Soc Com Alor SA	Plant at Oradea, near Hungarian border	250.
Do.	BBG Alum S.A. (51% owned by the Balli Group of the United Kingdom and the Bayrakter Co. of Turkey)	Plant at Tulcea, Danube Delta	400.
Aluminum, primary	SC Alro S.A. (Slatina Aluminium Enterprise)	120 kilometers west of Bucharest	270.
Barite	Ministry of Industry	Ortra mine, Rosia Montana, southwest of Cluj	100.
Bauxite	do.	Oradea-Dobresti Mining Complex, near Hungarian border	350.
Cement	Cimentul SA Turda	Plant at Turda, 600 kilometers from Port of Constanta	cement, 1,360; clinker, 850.
Do.	Cimentul SA Cimus	Plant at Cimpulung, about 499 kilometers from Port of Constanta	cement, 2,200; clinker, 1,360.
Do.	Moldocim SA Bicaz	Plant at Bicaz, about 450 kilometers from Port of Constanta	cement, 3,100; clinker, 1,520.
Do.	Romcif SA Fieni	Plant at Fieni, about 420 kilometers from Port of Constanta	cement, 1,600; clinker, 960.
Do.	Romcim SA	Plant at Alesd, 812 kilometers from Port of Constanta	cement, 3,500; clinker, 2,120.
Do.	do.	Plant at Hoghiz, 437 kilometers from Port of Constanta	cement, 2,200; clinker, 1,520.
Do.	do.	Medgidia plant, about 35 kilometers west of Constanta	cement, 3,500; clinker, 1,980.
Do.	do.	Plant at Jiu, about 533 kilometers from the Port of Constanta	cement, 3,000; clinker, 2,045.
Coal:			
Bituminous	Compania Nationala a Huilei-Petrosani	Valea Jiului Mining Complex, near Hunedoara	10,400.
Lignite	Societatea National a Lignitului Oltenia-Targu Jui	Jiu Valley, Oltenia County, north of Craiova	20,300.
Do.	Societatea National a Carbunelui-Ploiesti	About 50 kilometers north of Bucharest	8,700.
Copper:			
Ore (concentrate)	Compania Nationala REMIN S.A. and Compania Nationala Minvest	Baia Mare, Baia Sprie, and Cavnic Mines, northwestern area near the Ukrainian border; Rosia Montana, Noud, Borsa Balan, and Lesul Ursului Mines--in east-west arc along Carpathian range; Rosia Poieni Mine; and Moldova Noua Mine, southwest near Danubian border with Yugoslavia	180.
Metal	SC Allied Deals Phoenix SA	Outokumpu flash smelter and electrolytic refinery at Baia Mare in the Northwestern area, near the Ukrainian border	40.
Do.	SC Ampelum SA	Zlatna smelter and refinery, Apuseni, northwest Romania	13.
Ferroalloys	Ferom-Joint Stock Co.	Complex at Tulcea	280.

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TABLE 4--Continued
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity
Iron ore		Compania Nationala Minvest	Mining complex at Hunedoara, in west-central Romania	1,320.
Do.		do.	Resita Mining Complex, southwestern Romania, near Yugoslav border	660.
Do.		do.	Napoca-Cluj Mining Complex, northwestern Romania on the Somesul River	990.
Lead:				
In ore		Compania Nationala REMIN S.A.	Baia Mare Mine, near Ukrainian and Hungarian borders	24.
Do.		Compania Nationala Minvest	Balan Mine, 50 kilometers southwest of Piatra Neamt	10.
Metal		Sometra S.A.	Imperial Smelter at Copsa Mica, central Romania, on the Tirnava Mare River	42.
Natural gas	million cubic feet per year	Ministry of Industry, Department of Energy	Tirgu Mures Field at Tirgu Mures, north-central Romania	996,000.
Do.	do.	do.	Ploesti Field, 50 kilometers north of Bucharest	249,000.
Petroleum:				
Crude	42-gallon barrels per day	do.	Ploesti-Teleajen, Pitesti, and Tirgoviste Fields, in Prahova Valley around Bucharest; Bacau Field at Bacau, east-central Romania near the Siretul River; and West Carpathian Field, southeastern Carpathian Mountains, between the west bank of the Olt River and Tirgu Jiu	250,000.
Refined	do.	do.	Refineries at Brazil, Pitesti, Onesti, Barcau, Borzesti, Brasov, Cimpina, Darmanesti, Oradea, Ploesti, Teleajen, and Navodari	664,000.
Steel		Gavazzi Steel SA (formerly Otel Rosu)	Caras-Severin, southeastern region, near Yugoslav border	400.
Do.		Mechel Campia Turzii SA	Campia Turzii, Cluj, northwestern Romania	300.
Do.		Ispat Sidex SA Galati (Ispat, India and United Kingdom)	Danube River, north of Brail, near the Ukrainian border	10,000.
Do.		Siderurgica SA Hunedoara (LNM Holdings NV, United Kingdom)	West-central Romania, near Calan	2,135.
Do.		CSR S.A. Resita	Southwestern Romania, about 20 kilometers southwest of Caransebes	1,200.
Do.		Siderica SA Calarasi	Near the Bulgarian border close to the Danube	2,200.
Do.		Mechel Targoviste	Targoviste, Dimbovita, near Bucharest	450
Zinc:				
In ore		Compania Nationala Minvest	Baia Mare, near Ukrainian and Hungarian borders	60.
Metal		Sometra S.A.	Imperial Smelter at Copsa Mica, Tirnava River, central Romania	66.

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The Mineral Industries of the Southern Balkans

Albania, Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Montenegro, and Slovenia

By Walter G. Steblez

Europe's Southern Balkan (Adriatic) region is part of the southern Mediterranean Alpine folded zone, which extends through the Dinarides of the former Yugoslavia (Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Montenegro, and Slovenia), the Albanides of Albania, and the Hellenides of Greece. Mining for base and precious metals may be traced through historical records to at least 5th century B.C. Evidence of early workings at the Bor copper deposit in Serbia suggests prehistoric origins.

Mineral deposits in the region underwent extensive development and exploitation during the second half of the 20th century. Commercial resources of major base metals included those of aluminum, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, and zinc. Such precious metals as gold, palladium, platinum, and silver were found mainly in association with such base metals as copper, lead, and zinc. Industrial minerals included clays and volcanic materials and a broad range of carbonate and silicate rocks, gravels, and sands. Mineral fuels comprised coal (lignite), natural gas, and petroleum.

Until the early 1990s, the mining, processing, and downstream use of base metals established the region as a major European source of copper, lead, and zinc and a major world producer of chromite. The transition of the region from central economic planning to market economy systems between 1991 and 2001 also began a swift deconstruction of existing political and social structures. The ensuing political, social, and ethnic tensions and conflict destroyed or degraded much of the region's mineral industries and industrial infrastructure. In 2005, political and social tensions in the Province of Kosovo in Serbia and Montenegro and in Macedonia continued to abate, which improved conditions for capital investment. The future status of the mineral industries in the countries of the Adriatic Balkan region would be clarified following a political settlement and normalization not only among the states in the region, but also within these states, especially Bosnia and Herzegovina, Croatia, Macedonia, and Serbia and Montenegro.

ALBANIA

In 2005, Albania's gross domestic product (GDP) based on purchasing power parity amounted to about $16.3 billion. The GDP increased in constant dollars by 6% compared with that of 2004. Industrial production amounted to about 10% of the GDP compared with 14% of the GDP in 2004 (Institute of Statistics of Albania, 2005, p. 29).

Albania's mineral deposits included such metalliferous mineral commodities as chromite, copper ore, and nickeliferous iron ore and such mineral fuels as natural gas and petroleum. The decline in Albania's overall mineral production mainly stemmed from the country's transition from rigid central economic planning to a market economy; this process began in the early 1990s and has continued through 2005. Of the metal ores, only chromite and a token amount of copper were mined in 2005. In past decades, Albania was among the world's top three producers and exporters of chromite. In 2005, the output of marketable chromite (concentrate and direct shipping ore) increased significantly by about 22% compared with that of 2004. The output of ferrochromium declined by about 25% compared with that of 2004 (table 1).

Many of the country's remaining mineral producing enterprises continued to operate under foreign management. In the metals sector, these enterprises included the ferrochromium plants at Burrel and Elbasan (Darfo S.p.A. of Italy) and the Munelle Mine and other copper mines (Ber-Oner Madencilik San ve Tic As of Turkey).

Dolomite, gypsum, marble, phosphate rock, and other industrial minerals have been worked only intermittently during the past several years. Dolomite and kaolin were the only industrial minerals that were reported to have been produced in the years covered in table 1. The output of dolomite in 2005 declined by about 38% compared with that of 2004; mine production of kaolin increased by about 3.3%. The production of cement and clay increased by 8.5% and 3.3%, respectively, compared with output levels reached in 2004.

In 2005, the production of petroleum continued to increase; output was about 12% greater than that of 2004. The production of natural gas, however, declined by about 5%, and petroleum coke, by almost 18% (table 1). Canadian Banker Petroleum Ltd. continued to explore for oil and gas and to develop new wells at the Marinza and the Patos oilfields. In 2004, Banker Petroleum put 37 wells into production and ordered equipment for 20 wells for early 2005. According to company sources, petroleum resources at the Marinza and the Patos oilfields amounted to about 1.96 billion barrels; the development of these oilfields and the modernization of existing equipment would allow for maximum petroleum recovery of about 98 million barrels (Banker Petroleum Ltd., 2004; 2006).

Outlook

The development of Albania's mineral industry is contingent on such factors as the stability of social institutions, the creation of modern infrastructure, and the adoption of legislation that would attract foreign investment. International financial institutions have continued to assist Albania in developing these objectives.

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References Cited

Banker Petroleum Ltd., 2004, 2004 Patos Marinza program update: Calgary, Alberta, Canada, Banker Petroleum Ltd. press release, November 29, 3 p.
Banker Petroleum Ltd., 2006, Bankers Petroleum Ltd. announces Albania plan of development approval: Calgary, Alberta, Canada, Banker Petroleum Ltd. press release, March 31, 2 p.
Institute of Statistics of Albania, 2005, Albania in figures: Tirana, Albania, Institute of Statistics of Albania, 60 p.

BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina was a major industrial center and mineral producing area in the former Yugoslavia. The metallurgical sector included steel and aluminum enterprises; the latter provided feedstock for the former Yugoslavia's aircraft production. Major mineral resources included bauxite, iron ore, and lead-zinc ore. Resources of industrial minerals included but were not limited to asbestos, clays, gypsum, magnesite, and sand and gravel. Resources of mineral fuels included coal and minor deposits of petroleum. The dissolution of former the Yugoslavia in the early- to mid-1990s severed long-standing economic ties in the region; this partly accounted for a sharp reduction of production. Social unrest and armed civil strife, which damaged and (or) destroyed facilities and infrastructure, further depressed Bosnia and Herzegovina's mining and processing activity.

The rehabilitation of Bosnia and Herzegovina's mineral industry was gradual and uneven owing mainly to the semiautonomous status of the country's political subdivisions. Bosnia and Herzegovina continued to comprise two constituent regions: the Federation of Bosnian Moslems and Croatians (FBC) and Republika Sprska (RS), which accounted for about 51% and 49% of Bosnia and Herzegovina's territory, respectively. Consequently, Bosnia and Herzegovina's mineral resources and mining and processing facilities were exploited in the FBC and RS under virtually separate economic environments.

In 2005, Bosnia and Herzegovina's gross domestic product (GDP) based on purchasing power parity amounted to about $26.6 billion (International Monetary Fund, 2006§[1]). In constant dollars, the GDP increased by about 5.3% compared with that of 2004. The value of mining output in 2005 as a share of the GDP amounted to about 2.6%; the total value of mine production rose by about 17% compared with that of 2004 (Agency for the Statistics of Bosnia and Herzegovina, 2006). The total value of mine production in the FBC amounted to more than 4% of the GDP; the output value of industrial minerals, metal ores, and coal and peat increased by about 8%, 7%, and 3%, respectively, compared with output levels attained in 2004. In the RS, the total value of mining and quarrying output increased by about 18% compared with that of 2004; the output value of metal ores and coal and peat rose by about 66% and 11%, respectively. The value of industrial mineral mining in the RS, however, declined by about 8% compared with that of 2004 (Republika Srpska Institute of Statistics, 2006). The metals sector reported a rise in output of aluminum and steel.

In 2005, Aluminij d.d. Mostar (Mostar), which was located in FBC and was Bosnia and Herzegovina's sole producer of primary aluminum, reported a production increase of more than 8% compared with that of 2004. Bauxite production in the RS rebounded from a low output level of 71,312 metric tons (t) in 2002 to 821,000 t in 2004 and to an estimated (preliminary) 800,000 t in 2005. Mostar reported plans to increase the production capacity of primary aluminum by 15,000 metric tons per year (t/yr) (valued at $36 million) and to build a 9,000-t/yr aluminum semimanufactures plant, valued at $20 million, in 2006 (Metals Insider, 2006a, b). The production of lead and zinc concentrates in the RS was reported to have resumed in 2004 and 2005; the output of these commodities, however, remained well below output levels of the early 1990s.

In 2005, Mittal Steel Company Ltd. acquired a 41% share of BH Steel Zeljezara Ltd. (valued at $98 million) from the Kuwaiti Investment Agency, which was in addition to the 51% of BH Steel's shares that Mittal acquired in 2004 when it was formed by the merger of LNM Holdings of the United Kingdom and Ispat Group of India. With a clear majority (92%) share ownership of BH Steel, Mittal renamed the steel mill Mittal Steel Zenica (Zenica). In early 2005, Zenica completed the installation of a new 100-t electric arc furnace with a rated capacity of about 800,000 t/yr. The company also announced plans to invest about $200 million to restart integrated production at the mill (Mittal Steel Company Ltd., 2005; Reuters, 2005). In 2005, the country's steel production amounted to more than 283,000 t, which was close to two-and-one-half times the output level in 2004 (table 3).

Major activities in the energy sectors were centered on the acquisition of the Stanari lignite mine in RS by United Kingdom-based EFT Group and plans by EFT to build a 429-megawatt thermal power station near Stanari, which would use lignite from the Stanari Mine. The construction of the powerplant would cost about $303 million; the powerplant would supply about 25% of the total annual energy output of Bosnia and Herzegovina. About 2.8 million metric tons of lignite from the Stanari Mine annually would serve as feedstock for the powerplant (EFT Group, 2005; Petroleum Economist Ltd., 2005).

Outlook

The country's slow return to normalcy is becoming more evident. Foreign investment capital appears to be transecting territorial boundaries; production in the area's mineral industries is being restarted; and linkages among former commercial partners, which were terminated during the civil strife of the mid-1990s, are again being made.

References Cited

Agency for the Statistics of Bosnia and Herzegovina, 2006, Statistics of national accounts: Sarajevo, Bosnia and Herzegovina, no. 7, July 19, 4 p.
EFT Group, 2005, Stanari coal mine: London, United Kingdom, EFT Group press release, May, 1 p.
Metals Insider, 2006a, After record year Bosnian Smelter looks to expand: London, United Kingdom, January 6, p. 4.
Metals Insider, 2006b, Bosnian smelter in local profiles joint venture: London, United Kingdom, January 25, p. 5

[1]References that include a section mark (§) are found in the Internet Reference(s) Cited sections.

Digitized by Google

Mittal Steel Company Ltd., 2005, Mittal Steel Company N.V. increases shareholding in Mittal Steel Zenica to 92%: London, United Kingdom, Mittal Steel Company Ltd. press release, December 12, 2 p.
Petroleum Economist Ltd., 2005, Bosnia and Herzegovina: London, United Kingdom, v. 73, no. 2, February, p. 41.
Republika Srpska Institute of Statistics, 2006, Industry statistics release: Banja Luka, Republika Srpska, Bosnia and Herzegovina, no. xiv/1, January 24, 2 p.
Reuters, 2005, Bosnia's Mittal Steel 9-month output soars: London, United Kingdom, Reuters press release, October 28, 2 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Bosnia and Herzegovina, World Economic Outlook Database, accessed September 2006 at URL http://www.imf.org/external/pubs/ft/weo/2005/02/data/dbcselm.cfm.

CROATIA

Petroleum extraction and refining remained the main sector of Croatia's mineral industry. Industrial minerals quarrying and the production of metals played a far lesser role in meeting the country's mineral consumption needs.

Most of Croatia's output of industrial minerals was consumed in the domestic market. The country remained heavily reliant on imports of metals for its industrial needs.

In 2005, Croatia's gross domestic product (GDP) based on constant prices increased by about 4.3% compared with that of 2004. In 2005, the GDP was calculated to be $53 billion based on purchasing power parity (Crostat, 2006, p. 8; International Monetary Fund, 2006§). Industrial production rose by 5.1% compared with that of 2004. The total value of mining and quarrying output, however, declined by 3% compared with that of 2004. Exports of Croatia's crude materials, which amounted to $487 million (including those of the mining and quarrying sector, less mineral fuels), increased by about 8.5% compared with those of 2004. Similarly, imports of crude materials, which amounted to $379 million, increased by 7.4%. Mineral fuels exports, which amounted to about $1.2 billion, increased by $32 million compared with those of 2004; imports of mineral fuels rose by 41% (Crostat, 2006, p. 70).

The total output of energy carriers, in terms of value, fell short of the 2004 level of production by about 1.8%. In terms of the volume of output, the production of natural gas reportedly declined by about 1% compared with that of 2004; the production of petroleum (including condensate) declined by about 2% (table 5; Crostat, 2006, p. 9).

INA-Industrija Nafte d.d. Zagreb (INA), which was Croatia's state-owned natural gas and petroleum exploration and production company, reported total investments in exploration and development in 2005 of about $168 million. INA's investment in Croatia amounted to about $108 million, or more than 64% of the total; the balance of INA's investments in exploration projects were in such areas outside Croatia as Angola, Egypt, and Syria. INA's discreet exploration investment outlay amounted to about $42.4 million, of which $41.4 million was targeted for exploration sites in Syria; this resulted in moderate increases in reserves of condensate, natural gas, and petroleum at the Hayan block of the Jihar oil and gas deposit in Syria. Total outlays for domestic and foreign development projects amounted to about $125.4 million (INA-Industrija Nafte d.d., 2006, p. 26).

Domestic oilfield and gasfield developments in 2005 included the drilling of five wells: one gas well and four oil wells in the Pannonian Basin. At Medimurje, three natural gas fields were under development: the Vukanovec, the Vuckovec, and the Zebanec fields. Total output from these gasfields between 2008 and 2018 was expected to amount to an estimated 1.1 billion cubic meters of gas. The largest gasfield development project, however, was in the offshore Adriatic area. Production of natural gas from the Ika (five wells) and the Ida (six wells) fields was scheduled to start in early 2006 following the completion of five production platforms and the installation of connecting and export pipelines. The development of the Annamaria field, which is located between Croatia and Italy, was scheduled for completion in 2008, and the startup of production was slated for 2009. The Katarina gasfield also underwent development. A production platform was installed during the year, and three developmental wells were to be drilled in 2006. According to INA's annual report, total reserves of natural gas in Croatia as of December 31, 2005, amounted to about 29.8 million cubic meters; total resources amounted to about 34.8 million cubic meters (INA-Industrija Nafte d.d., 2006, p. 28, 38).

At yearend 2005, the Governments of Croatia and Hungary discussed possible cooperative ventures. These included connecting their oil and gas pipeline systems into a single network and the construction of a 340-kilometer liquefied natural gas terminal on the Adriatic Sea with outlets to major European distribution centers (Alexander's Gas & Oil Connections, 2006).

Outlook

The extraction and processing of hydrocarbons were expected to remain the principal elements of Croatia's mineral industry. Steel and industrial minerals designated for construction, however, may see increases of production in the future as infrastructure development begins to increase. The International Bank for Reconstruction and Development in conjunction with the International Finance Corporation chose Croatia as a priority market in Southern Europe for investment in infrastructure (International Bank for Reconstruction and Development and International Finance Corporation, 2004).

References Cited

Alexander's Gas & Oil Connections, 2006, Hungary and Croatia to intensify energy cooperation: Limbach, Germany, Alexander's Gas and Oil Connections, v. 11 no. 4, February 27, 1 p.
Crostat, 2006, Statisticke Informacije: Zagreb, Croatia, Crostat, 116 p.
INA-Industrija Nafte d.d., 2006, Annual report 2005: Zagreb, Croatia, INA-Industrial Nafte d.d., 55 p.
International Bank for Reconstruction and Development and International Finance Corporation, 2004, Country assistance strategy for the Republic of Croatia: Washington, DC, World Bank, No. 30717-HR, Annex A6, p. 4.

Internet Reference Cited

International Monetary Fund, 2006 (September), Croatia, World Economic Outlook Database, accessed September, 28, 2006, at URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/dbcselm.cfm

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MACEDONIA

The mineral industry of Macedonia continued to recover slowly in 2005. Macedonia's installed production capacities included those for the mining and processing of metals (mainly nonferrous) and for a variety of industrial minerals; mineral fuels were limited to the production of lignite. Crude petroleum was imported and processed at the country's sole domestic refinery. In 2005, the production of lead-zinc ores was not resumed; the output of these commodities ceased in 2003 owing to financial considerations and labor disputes; environmental issues also contributed to production stoppages and closures (table 7; Metal Bulletin, 2003).

The country's gross domestic product (GDP) based on purchasing power parity in 2005 amounted to about $15.4 billion; the real GDP in 2005 increased by about 4% compared with that of 2004 (International Monetary Fund, 2006§). Industrial production rose by about 7% compared with that of 2004 and represented about 41% of the GDP. Following a decline in the total value of the mining and quarrying sector in 2004, the total value of mining and quarrying output in 2005 rose by more than 40% compared with that of 2004.

In 2005, the output of lignite declined by about 4% compared with that of 2004, and the output of the mining and quarrying of industrial minerals increased by more than 3% compared with that of 2004 (table 7; Republic of Macedonia State Statistical Office, 2006). Overall, the mineral industry, which comprised the mining and quarrying of metals, industrial minerals, and mineral fuels, accounted for about 17% of total industrial output in 2005 (National Bank of Macedonia, 2006, p. 22).

Although the volume of trade was not available during the preparation of this survey, Macedonia's foreign trade expressed in U.S. dollar values does have bearing on volume, as constant currency values for 2004 and 2005 were used to create comparative indices. In 2005, the export of crude material, which included mineral commodities, increased by almost 54% compared with that of 2004. Exports of metal-bearing ores and metal scrap amounted to about $33 million, which was a more than threefold increase compared with those of 2004. Exports of crude mineral fertilizers and industrial minerals amounted to about $18.4 million, or an increase of about 16% compared with those of 2004. Exports of mineral fuels and lubricants amounted to about $164 million, which was a more than twofold increase compared with those of 2004. Macedonia's imports of crude material, (which included mineral commodities) increased by about 38% compared with those of 2004, and the value ($107 million) of crude material imports exceeded that of crude material exports by about 57%. Imports of metal-bearing ores and scrap amounted to about $48 million, which was an increase of about 49% compared with that of 2004. The value of imports of crude mineral fertilizers and industrial minerals, which amounted to almost $9 million, was about 47% that of exports in 2005. Imports of mineral fuels and lubricants amounted to about $618 million, which was an increase of almost 56% compared with that of 2004 and was almost fourfold the value of exports. In 2005, Macedonia's exports of iron and steel semimanufactures occupied a major position in the country's export trade profile. In terms of value, exports of iron and steel semimanufactures accounted for more than 26% of total exports (International Monetary Fund, 2006, p. 4-5; Republic of Macedonia State Statistical Office, 2006).

Macedonia's lead and zinc mining and processing operations remained moribund in 2005. These operations, which included the Sasa, the Toranica, and the Zletovo Mines, went into bankruptcy in 2004 in accordance with a Government decision that was made in consultation with the International Bank for Reconstruction and Development with the aim of privatizing the mines. Recent studies of these and related industries suggest that a restart of mining and processing operations would require extensive environmental remediation work. According to studies undertaken by the United Nations Environmental Programme, major point sources of environmental pollution in Macedonia and in the Balkans, in general, were mining and mineral processing facilities (Peck and Zinke, 2006, p. 24).

The Sasa Mine, which ceased effective lead and zinc production in 2003, reportedly had such substantial environmental issues as major dust emissions, mine and tailings dam discharges into surface aquifers, and an unlined tailings landfill with no effluent treatment at the base (Peck and Zinke, 2006, p. 26). The situation at the Zletovo Mine was analogous to that of the Sasa Mine: the tailings dam near the beneficiation plant has had a history of discharges into the outlaying aquifers; the tailings landfill reportedly was also unlined with no effluent treatment at the base. The Zletovo lead-zinc smelter at Veles reportedly was included among the problematic point sources of pollution, especially with respect to effluent discharges into outlying soils from the slag landfill. The Toranica Mine also lacked a tailings pond lining; effluents containing cadmium, lead, and zinc from the pond often contaminated nearby rivers and other aquifers. Similar environmental issues affected the country's chromite mines, copper mining and processing facilities, and ferroalloy producing plants (Peck, 2004, p. 105; Peck and Zinke, 2006, p. 27, 32).

Exploration activity during the year included plans by Sirius Exploration plc of the United Kingdom to undertake the evaluation of the Kadiica and the Osogovo copper porphyry deposits in northeastern Macedonia. Sirius was to undertake the work under the auspices of a joint-venture agreement with Phelps Dodge Corp. of the United States. Under the provisions of the joint-venture agreement, Phelps Dodge would develop the sites should they prove to be major copper-bearing deposits [2 million metric tons (Mt) of contained copper] and would reimburse Sirius at twice its exploration expenditure and 1.5% of future net smelting income. Sirius would be free to develop these properties if they do not meet the above criteria (Mining Journal, 2005).

Macedonia continued to produce bentonite, cement, feldspar, gypsum, sand and gravel, stone (carbonate and silicate), and other construction materials mainly for export. In 2005, exports of crude nonmetallic mineral exceeded imports by more than double.

Lignite mining and petroleum refining were the only industries in Macedonia's mineral fuels sector. Lignite production in 2005 amounted to about 8.2 Mt. Domestic mining supplied about 70% of the fuel for the Bitola coal-fired electric power station, which supplied more than 70% of the country's electricity needs. Lignite resources reportedly may be exhausted

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by 2010 at the present rate of production, however (National Bank of Macedonia, 2006, p. 71-72).

Outlook

Despite the moribund status of nonferrous metals production in 2005, the production of copper, lead-zinc, and associated metals was expected to resume and grow in volume owing not only to their availability but also to gradual environmental remediation and increasing regional stability and investor confidence. Foreign direct investment (FDI) in the country's mining and quarrying sector in 2005 amounted to more than $20.5 million, which was more than three times greater than FDI in 2004.

References Cited

International Monetary Fund, 2006, Former Yugoslav Republic of Macedonia—Selected issues: Washington D.C., International Monetary Fund, IMF Country report no. 06/345, October, 67 p.

Metal Bulletin, 2003, No end seen to Macedonian stand-off: Metal Bulletin, no. 8802, September 1, p. 5.

Mining Journal, 2005, Macedonian copper explorer to list: London, United Kingdom, Mining Journal, July 15, p. 12.

National Bank of Macedonia, 2006, Annual report 2005: Skopje, Macedonia, National Bank of Macedonia, April, 132 p.

Peck, Philip, 2004, Reducing environmental & security risks from mining in South Eastern Europe: Vienna, Austria, United Nations Environmental Programme, November, 161 p.

Peck, Philip, and Zinke, Alexander, 2006, South Eastern European mining—Related risks—Identification and verification of hot spots: Vienna, Austria, United Nations Environmental Programme, August, 58 p.

Republic of Macedonia State Statistical Office, 2006, External trade scope of the Republic of Macedonia, December 2005: Skopje, Macedonia, Republic of Macedonia State Statistical Office No. 7.1.6.02, February 2, 6 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Macedonia, World Economic Outlook Database, accessed September 2006, at URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/dbcselm.cfm.

SERBIA AND MONTENEGRO

Serbia and Montenegro was a modest producer of bauxite, copper, and lead and zinc ores, and such industrial minerals as clays, feldspar, gypsum, magnesite, pumice, and salt. The output of mineral fuels included coal, natural gas, and petroleum.

Despite internal tensions arising from Montenegro and Serbia's Kosovo Province's attempts to gain independent nation status, in 2005, Serbia and Montenegro displayed modest economic progress. According to the International Monetary Fund, Serbia and Montenegro continued to report overall economic growth in 2005. The gross domestic product (GDP) based on purchasing power parity amounted to about $43.1 billion; in constant prices, the GDP grew by about 4.5% compared with that of 2004 (International Monetary Fund, 2006§). Owing to the expected dissolution of the country into two independent republics, such Governmental agencies as the Statistical Office ceased to operate in 2006; consequently, most data for Serbia and Montenegro for 2005 was obtained separately from each republic.

The total value of industrial production in Serbia increased by about 0.8% compared with that of 2004. The overall value of mining and quarrying increased by 2.1% compared with that of 2004; the value of natural gas and petroleum production declined by 4.5% and that of coal mining increased by 2.9%; the output values of industrial minerals and metal ores increased by 17.2% and 5.8%, respectively. Serbia's output value of metals increased by about 16.7% compared with that of 2004; that of natural gas and petroleum derivatives and industrial minerals declined by 2.7% and 2.3%, respectively (table 9; Republichki Zavod za Statistiku Srbije, 2006, p. 254, 255).

In 2005, the value of Montenegro's total industrial output declined by almost 2% compared with that of 2004. The total output value of mining and quarrying increased by almost 2% compared with that of 2004. The output value of mineral fuels extraction declined by 13.3% compared with that of 2004; the output value of mining and quarrying of industrial minerals and metals, in aggregate, showed an increase of about 10.2% compared with the preceding year (Republika Crna Gora Zavod za Statistiku, 2006, p. 21).

The Government continued to reduce restrictions on foreign investment in the country's mineral industry. In 2005, foreign investment in the country's mineral industry encompassed such targets as the Rudarsko Topionicki Bazen Bor (RTB Bor) copper mining and processing complex in Serbia, the Rudnici Boksita bauxite mines in Montenegro, and magnesite and nickel interests in Serbia's Kosovo Province. Planned copper and gold exploration and development projects included three sites in eastern Serbia at Crni Vrh, with valuable associated minerals that included cadmium, germanium, lead, rhenium, selenium, and zinc (Reuters, 2005a).

Commodity Review

Metals

Aluminum.—Serbia and Montenegro's facilities for the production of primary aluminum were located in Montenegro. In 2005, the production of bauxite increased by more than 10% compared with that of 2004. Although alumina production fell short of output in 2004 by about 4%, aluminum production increased by about 1.7% compared with that of 2004 (table 9). Aluminum exports in 2005 exceeded 44,000 metric tons (t), which was an increase of about 33% compared with those of 2004; Slovenia and Italy were the principal aluminum importers in both years (Republichki Zavod za Statistiku Srbije, 2006, p. 289).

In 2005, Russia's RUSAL aluminum smelting complex acquired 65.4% of Kombinat Aluminijuma Podgorica (KAP) in Montenegro in midyear. In November, RUSAL also announced plans to acquire a 20-year concession to operate the Rudnici bauxite mine, which was a major feedstock supplier to KAP. The 20-year concession was valued at about $5 million (Metals Insider, 2005; Mining Journal, 2005b).

Copper.—Serbia remained Serbia and Montenegro's sole producer of copper ore and primary copper metal. In 2005, the gross mine output of copper ore increased by more than 9% compared with that of 2004. Copper in concentrate was

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26,100 t, which was an increase of about 9% compared with the preceding year; primary copper production was more than two-and-one-half times greater than that in 2004 (table 9). This, however, was an improvement over mine output of copper in 2003 when production fell by 28% compared with that of the preceding year. The production rebound in 2004-05 at the RTB Bor copper mining and processing complex followed production shortfalls that stemmed from facility expansion and restructuring in 2003 and 2004.

The mining and processing operations at RTB Bor were considered one of the major regional point sources of environmental pollution (airborne and those entrained into aquifers) and required remedial action prior to the company's privatization. Major pollutants included sulfates of cadmium, copper, iron, lead, and zinc. Additionally, a concrete culvert/collector beneath the flotation tailings site, which was in a state of deterioration, required rapid intervention. The International Bank for Reconstruction and Development approved a loan valued at about $30 million for upgrading the RTB Bor complex, especially those facilities that were largely responsible for environmental pollution. About $15 million was to be allocated for the reclamation of aquifers and lands adjacent to the RTB Bor complex (Tanjug, 2005; Peck and Zinke, 2006, p. 35-37, 40).

In addition to the mine and smelter output of copper, the ore mined and processed by RTB Bor also had such associated precious metals as gold, platinum-group metals (PGM), and silver, and also some base nonferrous metals.

In 2005, Dundee Precious Metals Inc. (Toronto, Ontario, Canada) and Eurasian Minerals Inc. (Vancouver, British Columbia, Canada) were granted exploration and mining concession contracts in the Bor region. Dundee was granted a concession to explore for copper and gold at Crni Vrh in eastern Serbia near Bor (Reuters, 2005a) The primary ore type in this region, which is known as the Timoc Magmatic Complex district (part of the Carpatho-Balkan Metallogenic Province), consists of porphyry deposits; such other ore types as epithermal deposits were believed to be near exhaustion. The main mineral commodities mined in the Timoc district were copper, gold, and silver; important associated commodities were lead and zinc, molybdenum, and PGMs; the principal ore deposits in this region, apart from Bor, are the Majdanpek, the Veliki Krivelj, and the Borska Reka deposits (Republic of Serbia Ministry of Mining and Energy, 2004, p. 20). Dundee's target sites additionally were believed to contain cadmium, germanium, rhenium, and selenium. The grant permitted Dundee to conduct exploration and survey work for 3 years with a possible 2-year extension. Also, mining concessions were granted for 25 years. Dundee planned outlays totaling $13.6 million for the 2006 exploration program (Dundee Precious Metals Inc., 2006).

Eurasian Minerals Inc. of Vancouver, British Columbia, Canada, was granted an exploration permit for the Borovo-Donje Nevlje and the Brestovac areas near Bor in the Timoc Magmatic Complex, which is endowed with resources of about 20 million metric tons (Mt) of copper and about 1,000 t of gold. The Brestovac permit covers an area of about 77 square kilometers (km^2) and comprises the Brestovac area (25 km^2) and the Zlot area (52 km^2); initial drill results indicated zinc (2.07% to 4.67%), copper (0.11% to 0.13%), and gold (0.4 grams per metric ton) (Eurasian Minerals Inc., 2005a, b). Additionally, exploration and survey work by Eurasian Minerals continued in the region at the Lece, the Plavkovo, the Stara Planina, and the Zajaca exploration permits, which were granted by the Government in 2004. Initial rock chip sampling showed varying amounts of copper, gold, lead, and zinc in these areas (Eurasian Minerals Inc., 2005a, b).

In 2005, Cambridge Mineral Resources plc of the United Kingdom, which was the corporate successor to Hereward Ventures plc, continued exploration work at the Gradishte, the Ivan Kula, and the Tulare permit areas. Trenching results at Gradishte indicated the presence of porphyry-based copper and gold (Cambridge Mineral Resources plc, 2005, p. 3).

Iron and Steel.—In 2005, the combined crude steel production from Serbia and Montenegro's two steel mills increased by more than 10% compared with that of 2004; the output of pig iron increased by about 16% during the same period. U.S. Steel Serbia (USSB) (a subsidiary of the U.S. Steel Corporation since 2003; formerly Sartid AD) in Serbia and HK Zeljezara Niksic AD in Montenegro had effective steelmaking capacities of about 2.2 Mt and 300,000 t, respectively. In 2005, USSB reported that it had upgraded and restarted the second blast furnace, which had been taken offline in 1987. The blast furnace rebuilding project, which was valued at $33 million, would bring USSB to its full capacity of 2.2 Mt from the 1.1-Mt production level of 2004 (Reuters, 2005b). In 2005, the privatization of Zeljezara Niksic remained unsettled. In September, the Agency for Economic Restructuring and Foreign Investments extended the submission deadline for bids to the end of the year.

Lead and Zinc.—A clearer picture of future mine production of lead and zinc awaits the resolution of the final political status of Serbia's lead-and zinc-rich Kosovo Province and definitive exploration results in the Bor region. Rudarsko-Metalursko-Hemijski Kombinat za Olovo I Cink Trepca [Trepca lead-zinc mining, beneficiation, and smelting complex (Trepca)] remained under a United Nations (UN) protectorate status. In 2005, the production of refined lead appeared to have ceased, although mining continued; output at yearend amounted to more than 160,000 t of ore, in which recoverable lead and zinc were about 1,800 t and 3,000 t, respectively (table 9).

Industrial Minerals

Serbia and Montenegro produced a broad range of industrial minerals, which included cement, crude magnesite, lime, quartz sand, and sand and gravel. In 2005, the total value of mine output of industrial minerals increased by more than 17% compared with that of 2004 (Republichki Zavod za Statistiku Srbije, 2006, p. 254). In 2005, one of the major issues in this sector included a concession, which was granted by the Serbian Government to Rio Tinto plc of the United Kingdom, to explore for and mine boron in the Jarondol Basin. Reportedly, Rio Tinto planned to allocate about $26 million for exploration and during any subsequent mining would return 3% of the total net revenue from boron mining to the Serbian Government (Reuters, 2005a).

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Mineral Fuels

In the mineral fuels sector, the increases in the output of brown coal and lignite were the chief factors in the total increase of coal production of about 3.5% compared with that of 2004. In 2005, the value of coal imports rose by 9.3%; imports (volume) of natural gas and petroleum, however, declined by 18% and 16%, respectively, compared with those of 2004. In 2005, the Russian Federation remained Serbia and Montenegro's main supplier of fossil fuels. Complete statistical data were available only for Serbia for 2005. Given Serbia's significantly greater size and industrial infrastructure, however, Serbia's trade data, which show the Russian Federation supplying 100% of Serbia's gas imports and about 91% of the petroleum imports, would account for the major portion of the country's total mineral trade (Republichki Zavod za Statistiku Srbije, 2006, p. 292).

The Mineral Industry of the Serbian Province of Kosovo

The Serbian Province of Kosovo became a UN protectorate in 1999 under the provisions of UN Security Council Resolution 1244 following the Kosovo crisis that year. More recently, the UN Interim Administration Mission in Kosovo (UNMIK) was involved in efforts to restore Kosovo's infrastructure, industry, and economy, in general, much of which was damaged or destroyed in the conflict of 1999. To promote the reconstruction and development of Kosovo's mineral sector, UNMIK undertook the drafting of mining legislation and the establishment of an independent commission on mines and minerals. The Province of Kosovo's mineral assets include metals [bauxite, iron ore (nickeliferous), and lead-zinc ore], mineral fuels (lignite), and industrial minerals (aggregates, dimension stone, and magnesite) (International Bank for Reconstruction and Development, 2005, p. 3–7). Major events in 2005 included the reactivation of the Trepca lead and zinc mining and processing facilities, which had been dormant since the end of hostilities in the area in 1999 (Ibraj, 2005). Other mineral assets that were being privatized included the Glogovac ferronickel plant, three associated nickeliferous iron ore mines, and the Goleshi and the Strezoc magnesite mines and processing facilities (Ibraj, 2005; Mining Journal, 2005a)

Outlook

Serbia and Montenegro is slowly recovering from extreme political and social tension, which pervaded the region in the late 1990s and early 2000s and disrupted long-established regional markets. The production of all minerals is expected to recover slowly during the next several years owing to such factors as investor reticence stemming from a lack of full regional stability, especially the uncertainty about Kosovo's future status.

References Cited

Cambridge Mineral Resources plc, 2005, Annual report & accounts 2005: London, United Kingdom, Cambridge Mineral Resource plc, June, 36 p.

Dundee Precious Metals Inc., 2006, Operations—Serbia: Toronto, Ontario, Canada, Dundee Precious Metals Inc. press release, April, 2 p.

Eurasian Minerals Inc., 2005a, Gold mineralized zone drilled at Brestovac, Serbia: Vancouver, British Columbia, Canada, Eurasian Minerals Inc. press release, July 8, 2 p.

Eurasian Minerals Inc., 2005b, Two new exploration permits granted Serbia: Vancouver, British Columbia, Canada, Eurasian Minerals Inc., press release, March 4, 2 p.

Ibraj, Luan, 2005 Trepca mines in Kosovo resume operations: Washington, DC, One World, Southeast Europe press release, August 23, 1 p.

International Bank for Reconstruction and Development, 2005, Project appraisal document on a proposed grant in the amount of SDR 1.7 million (USD2.5 million equivalent) to the United Nations Interim Administration Mission in Kosovo for the Benefit of Kosovo for an energy technical assistance project-III: International Bank for Reconstruction and Development, Washington, DC, No. 31430-XK, February 24, 60 p.

Metals Insider, 2005, RusAl to operate Montenegro bauxite mine: London, United Kingdom, Sucden, December 2, p. 7.

Mining Journal, 2005a, Kosovan nickel investor chosen: London, United Kingdom, November 25, p. 1.

Mining Journal, 2005b, Podgorica bid: London, United Kingdom, Mining Communications, January 28, p. 7.

Peck, Philip and Zinke, Alexander, 2006, South Eastern European mining—Related risks—Identification and verification of hot spots: Vienna, Austria, United Nations Environmental Programme, August, 58 p.

Republichki Zavod za Statistiku Srbije, 2006, Statistichki godishniak Srbije 2006: Belgrade, Serbia, 461 p.

Republic of Serbia Ministry of Mining and Energy, 2004, Mining districts of Serbia—District data base: Belgrade, Republic of Serbia, Republic of Serbia Ministry of Mining and Energy, 23 p.

Republika Crna Gora Zavod za Statistiku, 2006, Crna Gora u brojkama: Podgorica, Montenegro, 28 p.

Reuters, 2005a, Serbia grants concessions to Rio Tinto, Dundee: London, United Kingdom, Reuters press release, November 17, 2 p.

Reuters, 2005b, U.S. Steel Serbia unit doubles output capacity: London, United Kingdom, Reuters press release, June 20, 4 p.

Tanjug, 2005, World Bank approves $30 million loan for RTB Bor: Belgrade, Serbia and Montenegro, Tanjug, September 13, 20:33: 46 CET.

Internet Reference Cited

International Monetary Fund, 2006 (September), Serbia and Montenegro, World Economic Outlook Database, accessed September 2006, at URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/dbcselm.cfm.

SLOVENIA

Slovenia remained reliant on imports of minerals to meet the needs of its economy. Domestic mine production continued to be limited to the extraction of coal, natural gas, petroleum, and a variety of industrial minerals. In 2005, imports of crude materials (including ores and concentrates), mineral fuels, and metals (ferrous and nonferrous) constituted about 22% of total imports. In terms of value, imports in these categories exceeded exports by almost two times (Statistical Office of the Republic of Slovenia, 2006, p. 58-59).

In 2005, Slovenia's gross domestic product (GDP) based of purchasing power parity amounted to $43.045 billion. In constant dollars, the GDP increased by 4.1% compared with that of 2004. Industrial production rose by about 3.4% compared with that of 2004. The total value of mine and quarry production increased by almost 7% compared with that of 2004. The output value of basic metals and semimanufactures increased by about 8% during the same period. Exports of crude materials (including metals and industrial minerals) accounted for about 2.2% of total exports in 2005; imports of crude materials accounted for about 5.3% of total imports (Statistical Office of the Republic of Slovenia, 2006, p. 43, 56, 57).

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The Kidriçevo Talum d.o.o. primary aluminum smelter and three steel mills [Slovenske Železarne (SŽ), which was a state-owned holding company that maintained ownership of SŽAcroni Jesenice d.o.o. (Acroni) and SŽ Metal Ravne d.o.o. (Metal Ravne); and Store Steel Ltd. (formerly a subsidiary of the Inexa Group of Sweden since 1999)] were the main components of Slovenia's metallurgical industry.

In 2005, Talum's output (by volume) of primary and secondary aluminum increased by about 15% compared with that of 2004. The value of aluminum exports declined by more than 1% compared with that of 2004; Italy was the leading importer of aluminum from Slovenia, accounting for about 41% of total imports.

In 2005, Talum's management decided to close potline B owing to cost considerations involved in modernizing the potline to meet the European Union's environmental standards. Aluminum production levels would be maintained through increased processing of secondary aluminum. Talum planned to expand the capacity of potline C, whose output would be mixed with remelted aluminum scrap (Metals Insider, 2006).

In 2005, Slovenia's total output of crude steel rose by about 6.8% compared with that of 2004; the output of steel semimanufactures rose by about 2.9% (table 11). Acroni, which was the country's major producer of crude steel, reported that it was continuing facility modernization that included the installation of a new line for solution annealing of stainless steel plates, the replacement of bell-type annealing furnaces, and a series of units for pollution abatement. Also, the company undertook a modernization study of its rolling mill with the objective of performing a total upgrade to be completed by 2010 (SŽAcroni Jesenice d.o.o., 2006, p. 3, 18). In 2005, Acroni's total sales amounted to 267,196 metric tons of steel, which was an increase of almost 1% compared with those of 2004; sales revenues, however, increased by almost 15% (SŽAcroni Jesenice d.o.o., 2006, p. 5).

In 2005, Slovenia's production of natural gas, petroleum, and brown coal and lignite, declined by14%, 13.3%, and 5.6%, respectively, compared with output levels attained in 2004 (table 11). In 2005, imports of mineral fuels increased to about 10.6% of total imports compared with 8.2% in 2004.

Outlook

During the past decade, Slovenia's economic transition from a central planning model to an open market system has gradually diminished the role of the mineral industry; higher value industries began playing an increasingly greater role in the country's economy. Raw materials needed by Slovenian industry to a greater extent are from sources that are beyond the country's borders.

References Cited

Metals Insider, 2006, Slovenia smelter to phase out older technology: Ljubljana, Slovenia, Metals Insider, February 7, p. 6.

Statistical Office of the Republic of Slovenia, 2006, Slovenia in figures: Ljubljana, Slovenia, Statistical Office of the Republic of Slovenia, 70 p.

SŽAcroni Jesenice d.o.o., 2006, Acroni annual report 2005: Jesenice, Slovenia, SŽAcroni Jesenice d.o.o, 64 p.

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TABLE 1
ALBANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Bauxite[e]		5,000	5,000	5,000	-- [r]	-- [3]
Chromium:						
Chromite, gross weight[e]		200,000	215,000	220,000	160,300 [r]	170,000 [3]
Marketable ore and concentrate:						
Marketable ore (41.6% Cr_2O_3)		86,000	82,000	89,000 [r]	40,000 [r]	50,000
Concentrate		--	9,000	10,000	14,430 [r]	16,270
Total		86,000	91,000	99,000 [r]	54,430 [r]	66,270
Ferrochromium		11,900	22,800	37,800	47,700 [r]	35,780
Copper:						
Ore:						
Gross weight		--	--	--	29,030	73,000
Concentrate:						
Gross weight		--	--	--	3,210	8,480
Cu content[e]		--	--	--	642	1,696 [3]
Iron and steel:						
Crude steel[e]		94,100	96,600	86,117	98,026	140,000
Rolled steel		--	--	--	135,000	150,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	--	348 [r]	578	530 [r]	575 [e]
Clay, kaolin[e]	do.	385	350	--	300 [r]	310
Dolomite[e]		500,000 [r]	1,000,000 [r]	1,500,000 [r]	1,613,000 [r,3]	1,000,000
Olivinite[e]		200	200	200	200	200
Salt		25,783	22,746	21,448	24,783	25,000 [e]
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bitumen, natural[4]		--	4,200	42,076	61,035	60,000 [e]
Coal, lignite	thousand metric tons	16,400	20,300	18,000	12,600 [r]	12,000 [e]
Gas, natural, gross production[5]	thousand cubic meters	10,980	9,150	11,617	11,965	11,347
Petroleum:						
Coke		45,000	40,000	57,541	58,712	47,900
Crude, gross weight		329,370	350,038	359,253	399,740 [r]	448,041

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, a variety of industrial minerals and construction materials (common clay, quartz, titanomagnetite, stone, and sand and gravel) are produced, but output is not reported quantitatively, and available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Includes asphalt and bitumen produced at petroleum refineries.

[5]Separate data on marketable production are not available, but gross and marketed output are regarded as being nearly equal.

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TABLE 2
ALBANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity		Location of main facilities (all state-owned)	Annual capacity
Cement		Elbasan, 32 kilometers southeast of Tirana; Kruje, 20 kilometers northwest of Tirana; Shkoder, 85 kilometers northwest of Tirana; and Vlore, southwest of Tirana	1,200
Chromite		Bater (including Bater I and II and Martanesh), 40 kilometers northwest of Tirana	450
Do.		Bulquize (including Bulquize south, Fush, Termove, and Todo Maco), 35 kilometers northwest of Tirana	450
Do.		Kalimash, 60 kilometers north of Tirana	250
Do.		Kam, 70 kilometers north of Tirana	100
Do.		Klos, 20 kilometers northeast of Tirana	50
Do.		Pogradec (including Katjiel, Memelisht, Pojske, Pishkash, and Prrenjas), 50 kilometers east of Tirana	100
Coal, lignite		Maneze, Mezes, and Valias Mines in Tirana Durres area; Krabe Mine, 20 kilometers southeast of Tirana; Alarup and Cervnake Mines, in Pogradec area, 80 kilometers southeast of Tirana; Mborje-Drenove Mine in Korce area, 85 kilometers southwest of Tirana; and Memaliaj Mine in Tepelene area, 110 kilometers south of Tirana	2,500
Copper:			
Ore		Fushe-Arrez, 80 kilometers north of Tirana	350
Do.		Gjejan, 100 kilometers northeast of Tirana	150
Do.		Golaj (including Nikoliq and Pus), 120 kilometers northeast of Tirana	150
Do.		Kurbnesh-Perlat, 55 kilometers northeast of Tirana	100
Do.		Rehove, 110 kilometers southeast of Tirana	100
Do.		Reps (including Gurch, Lajo, Spac, and Thurr), 55 kilometers north of Tirana	350
Do.		Rreshen, 50 kilometers north of Tirana	50
Do.		Shkoder (including Palaj, Karma I and II), 85 kilometers northwest of Tirana	100
Smelter		Kukes, 110 kilometers northeast of Tirana	6
Do.		Lac, 35 kilometers northwest of Tirana	7
Do.		Rubik, 50 kilometers north of Tirana	4
Ferrochromium		Burrel, 35 kilometers northeast of Tirana	40
Do.		Elbasan, 32 kilometers southeast of Tirana	36
Iron ore		Prrenjas (Bushtrica, Prrenjas, Skorska I and II), 70 kilometers southeast of Tirana	650
Do.		Guri i Kuq (including Cervenake, Grasishta, Guri i Kuq, Hudenisht and Guri Pergjrgjur), 25 kilometers east of Tirana	500
Natural gas	million cubic feet	Gasfields on southwest Albania between Ballsh and Fier	16,000
Nickel, smelter		Elbasan	6
Petroleum:			
Crude	42-gallon barrels per day	Oilfields at Marineze, Ballsh, Shqisht, Patos, Kucova, Gorrisht, and others	35,000
Refined	do.	Refineries: Ballsh, Cerrik, Fier, and Stalin	33,000
Steel		Steel of the Party Metallurgical Combine at Elbasan	150

[1]A substantial portion of these enterprises have been operating significantly below capacity during the transition to a market economy; the capacities provided in this table represent only the latest available information and may not show the true status of these enterprises.

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TABLE 3
BOSNIA AND HERZEGOVINA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Bauxite		90,027	71,312	573,000	916,928 r	900,000
Alumina, metallurgical grade		30,928	--	35,011	356,844 r	350,000
Metal, ingot; primary and secondary		95,064	102,271	112,503	121,296 r	131,232
Iron and steel:						
Ore and concentrate:						
Gross weight		264,540	212,114	126,929	280,596 r	300,000
Fe content		132,000	106,000	63,000	140,300 r	150,000
Metal:						
Ferroalloys[e]		20,000 r	20,000 r	20,000 r	19,820 r, 3	15,000
Pig iron[e]		60,000	60,000	60,000	60,000	60,000
Crude steel		138,685	115,222	166,368	117,170	283,111
Semimanufactures[e]		160,000	150,000	113,000	150,000	150,000
Lead:						
Concentrate, gross weight		3,271	--	--	1,668 r	1,700
Metal, smelter, primary and secondary[e]		100	100	100	35 r	50
Manganese ore:[e]						
Gross weight		2,000	2,000	2,000	2,000	2,000
Mn content		500	500	500	500	500
Zinc concentrate, gross weight		3,432	--	--	2,135 r	2,200
INDUSTRIAL MINERALS						
Asbestos, all kinds[e]		500	500	500	500	500
Barite concentrate[e]		100	80	80	65 r	70
Cement	thousand metric tons	703,843	912,611	890,179	1,044,944	1,000,000
Clays:						
Bentonite		9,829 r	13,050 r	16,967 r	24,353 r	25,000
Ceramic clay, crude		40,097	4,340	35,861	16,784 r	20,000
Fire clay, crude		34	10	--	--	--
Kaolin:						
Crude		13,000 r	6,500 r	50,000	46,000 3	45,000
Calcined		5,000 r	3,000 r	--	--	--
Dolomite, crude		49,073	96,584	96,776	223,378 r	200,000
Gypsum:						
Crude		76,100	44,200	63,050 r	139,520 r	55,000
Calcined		6,052	6,504	6,042	6,000 e	6,000
Lime		88,839	58,316	79,302 r	146,000 r	120,000
Magnesite, crude		2,000	2,000	2,000	2,000	2,000
Nitrogen, N content of ammonia		500	500	500	500	500
Quartz, quartzite, glass sand[e]		50,000	50,000	50,000	50,000	50,000
Salt, all sources		200,000	200,000	200,000	260,500	250,000
Sand and gravel, excluding glass sand	thousand cubic meters	348	362	476	450	400
Sodium compounds:						
Soda ash		36,882	--	11,804	11,000 e	11,000 e
Caustic soda[e]		5,000	5,000	5,000	5,000	5,000
Sodium bicarbonate[e]		500	500	500	500	500
Stone (excluding quartz and quartzite), dimension, crude:						
Ornamental	square meters	41,700	35,900	35,800	35,000 e	35,000 e
Crushed and brown, n.e.s.	thousand cubic meters	231	321	153	150	150
Other	cubic meters	10,540	11	--	--	--
Sulfur, byproduct of metallurgy[e]		1 r	--	--	--	--
MINERAL FUELS AND RELATED MATERIALS						
Brown coal and lignite	thousand metric tons	7,579	7,799	9,006	8,896 r	9,000
Petroleum refinery products		326,000	291,000	72,000	110,000	110,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to commodities listed, common clay was also produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

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TABLE 4
BOSNIA AND HERZEGOVINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Alumina		Energoinvest	Plants at Birac-Zvornik	600
Do.		do.	Plant at Mostar	280
Aluminum		Aluminij d.d. Mostar.	Smelter at Mostar	150
Bauxite		Energoinvest	Mines at Vlasenica, Jajce, Bosanska Krupa, Posusje, Listica, Citluk, and other locations	2,000
Cement		Tvornica Cementa Kakanj d.d.	Plant at Kakanj	650
Do.		D.D. Fabrica Cementa Lukavac	Plant in Lukavac	340
Coal:				
Brown		SOUR Titovi Rudnici Uglja, Tuzla	Mines in BiH	12,000
Lignite		do.	do.	7,000
Ferroalloys		Elktrobosna, Elektrohemijska i Eletrotermijska Industrija	Plant at Jajce	80
Iron ore		Rudarsko Metalurski Kombinat Zenica	Mines at Vares, Ljubija, and Radovan	5,000
Lead-zinc ore		Energoinvest	Mine and mill at Srebrenica	300
Manganese ore		Mangan-Energoinvest	Mine and concentrator at Buzim	100
Petroleum, refined	thousand 42-gallon barrels per day	Energoinvest: Rafinerija Nafte Bosanski Brod	Refinery at Bosanski Brod	100
Pig iron		B-H Steel-Zeljezara Ltd. (Kuwait Consulting and Investment, 50%, and Zeljezara Zenica Ltd., 50%)	Blast furnace at Zenica	2,250
Salt, rock	cubic meters per year	Hemijski Kombinat "Sodaso," Rudnik Soli i Solni Bunari	Mines at Tusanj	120,000
Do.	do.	do.	Production from brine at Tuzla, BiH	2,000,000
Steel, crude		Mittal Steel Zenica (Mittal Steel Company Ltd., 92%)	Plant at Zenica	2,060

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TABLE 5
CROATIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005[e]
METALS						
Aluminum:						
Metal, ingot, primary and secondary		16,019	1,000	1,200	5,500	4,400
Alloys		823	812	1,180	1,100	1,100
Semimanufactures, rolled		34,106	33,774	38,114	35,000	35,000
Ferrochromium		361	--	--	--	--
Steel:						
Crude, from electric furnaces		57,993	33,851	43,380	80,000 [r]	69,000
Semimanufactures:						
Bars and wire rod		31,583	2,078	17,459	35,000 [r]	30,000
Seamless tubes		35,297	23,435	25,728	50,000 [r]	30,000
Welded pipe		39,935	37,509	67,501	50,000 [e]	50,000 [e]
INDUSTRIAL MINERALS						
Cement	thousand metric tons	3,246	3,378	3,654	3,811	3,800
Clays:						
Bentonite		10,580	12,102	13,568	16,000	15,000
Ceramic clay[e]		6,000	150,000	188,000 [3]	637,000	200,000
Gypsum:						
Crude		130,861	145,000	166,000	148,000	150,000
Calcined		1,217	1,200	1,400 [e]	1,200 [e]	1,200 [e]
Lime	thousand metric tons	253	269	251	250	250
Nitrogen, N content of ammonia	do.	316	289	322	404	400
Pumice and related materials, volcanic tuff	do.	42	41	29	23	20
Salt, all sources		32,585	36,885	31,281	23,000	25,000
Sand and gravel, excluding glass sand	thousand cubic meters	3,500	4,650	4,878	35,000	35,000
Silica:						
Quartz, quartzite, glass sand		252,013	275,121	237,141	128,000	130,000
Glass:						
Flat glass	thousand square meters	305	390	495	400 [e]	400 [e]
Container glass		140,570	148,612	171,070	150,000 [e]	150,000 [e]
Other hollow glass		1,631	1,711	1,466	1,400 [e]	1,400 [e]
Stone, excluding quartz and quartzite, dimension stone, crude:						
Ornamental	square meters	1,044,944	1,127,948	1,093,573	1,000,000 [e]	1,000,000 [e]
Crushed and brown, n.e.s.	thousand metric tons	12,941	14,736	19,022	19,000 [e]	19,000 [e]
Other[e]	cubic meters	25,000	25,000	25,000	20,000	20,000
Sulfur, byproduct of petroleum[e]		15,000	7,069	7,471	7,500 [e]	7,500 [e]
MINERAL FUELS AND RELATED MATERIALS						
Carbon black		21,180	19,386	21,497	21,000 [e]	20,000
Natural gas, gross production	million cubic meters	2,010	2,122	2,190	1,851	1,837
Petroleum, crude:						
As reported, includes condensate	thousand metric tons	1,121	1,108	1,052	1,155 [r]	1,134
Refinery products		5,400,000	4,513,338	4,742,012	4,500,000 [e]	4,500,000 [e]

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to commodities listed, common clay also was produced, but available information is inadequate to make reliable estimates of output levels.

[3]Reported figure.

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TABLE 6
CROATIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Alumina		Jadral, Jadranski Aluminijum	Jadral Alumina Plant	150
Aluminum		Boris Kidric Tvornica Lakih Metala	Smelter at Sibenik	75
Do.		Top-Tvornica Olovni i Aluminjskikh	Semimanufactures producer at Savska	NA
Cement		Dalmacija Cement	Sv. Jurai plant at Kastel Sucurac	1,300
Do.		do.	Sv. Kajo plant at Solin	750
Do.		do.	Majdan plant at Solin Majdan	780
Do.		Istra Cement International D.D.	Plant at Pula	70
Do.		Tvornica Cementa Koromacno	Plant at Koromacno	420
Do.		Tvornica Cementa Umag D.D.	Cement plant at Umag	480
Do.		Nasicecement D.D.	Nacise plant at Tajnovac	840
Coal, bituminous		Istarski Ugljenokopi Rasa	Mines at Labin and Potpican	500
Natural gas	million cubic feet	Industrija Nafted.d. Zagreb (INA)	Main natural gasfields at Bogsic Lug and Molve	70,000
Petroleum, crude	thousand 42-gallon barrels per day	do.	Oilfields in Croatia and Slovenia (Benicanci, Zutica, Struzec, Ivanic Grad, Lendava, and others locations)	70
Do.	do.	do.	Refineries at Urinj and Rijeka	160
Do.	do.	do.	Refinery at Sisak	150
Pig iron		Metalurski Kombinat Zeljezara Sisak	2 blast furnaces at Sisak	235
Salt	cubic meters	Solana Pag, Solana Ante Festin	Marine salt: Pag Island	13
Steel, crude		SP MK Zeljezare Sisak d.d.	Plant at Sisak	75
Do.		Jadranska Zelejzara Split	Plant at Split	170

NA Not available.

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TABLE 7
MACEDONIA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity[3]		2001	2002	2003	2004	2005
METALS						
Aluminum, metal, ingot, secondary		4,000	4,000	4,000	4,000	4,000
Cadmium, smelter output	kilograms	73 [4]	111 [4]	75 [4]	--	--
Copper, mine and concentrator output:						
Ore, gross weight	thousand metric tons	1,500	1,200	1,200	--	5,000
Concentrate, gross weight		25,000	15,000	15,000	--	110,000
Concentrate, Cu content		9,000	5,600	2,567 [r]	--	21,800 [4]
Gold	kilograms	500	500	400	--	750
Iron and steel:						
Iron ore:						
Concentrate		10,000	10,000	10,000	10,000	10,000
Pellets		10,000	10,000	10,000	10,000	10,000
Agglomerate		5,000	5,000	5,000	5,000	5,000
Metal:						
Ferroalloys:						
Ferronickel (38% Ni), gross weight		10,300 [4]	17,000 [4]	15,000 [r]	14,000 [r]	15,000
Ferrosilicon		50,000	60,000 [r]	50,000	56,000 [r]	50,000
Total		60,300	77,000 [r]	65,000 [r]	70,000 [r]	65,000
Steel, crude		217,758 [r, 4]	224,601 [4]	291,354 [4]	315,000 [4]	350,000 [4]
Semimanufactures		296,279 [r, 4]	261,886 [4]	305,111 [4]	637,000 [4]	650,000 [4]
Lead:						
Mine output:						
Ore gross weight (Pb-Zn ore)		600,000	200,000	40,000	-- [4]	--
Concentrate, Pb content		20,000	15,000 [4]	5,000 [4]	-- [4]	--
Primary and secondary:						
Smelter		8,000	3,500	3,500	-- [4]	--
Refined		19,700	19,800	8,000 [4]	-- [4]	--
Nickel, metal, Ni content of FeNi		3,100 [4]	5,149 [4]	5,629 [4]	5,300 [4]	8,100 [4]
Silver	kilograms	15,000	12,000	10,000	--	--
Zinc:						
Concentrate, Zn content		20,000 [e]	10,000 [e]	4,000 [4]	-- [4]	--
Metal, refined, primary and secondary		52,000	38,000	15,100 [4]	-- [4]	--
INDUSTRIAL MINERALS						
Cement	thousand metric tons	630 [4]	600	768 [4]	820 [4]	800
Clays, bentonite		25,000	25,000	25,000	25,000	25,000
Diatomite		5,000	5,000	5,000	5,000	5,000
Feldspar		20,449 [4]	21,000	21,000	21,000	20,000
Gypsum:						
Crude		20,000	20,000	20,000	20,000	20,000
Calcined		3,000	3,000	3,000	3,000	3,000
Lime		500	500	500	500	500
Pumice and related materials, volcanic tuff		50,000	50,000	50,000	50,000	50,000
Sand and gravel, excluding glass sand	thousand cubic meters	100	100	100	100	100
Stone, excluding quartz and quartzite:						
Dimension, crude	square meters	150,000	150,000	150,000	150,000	150,000
Ornamental	thousand cubic meters	300	300	300	300	300
Crushed and brown, n.e.s.	cubic meters	5,000	5,000	5,000	5,000	5,000
Other	thousand metric tons	26,000	25,000	25,000	25,000	25,000
Talc:		800	800	800	800	800
Crude		557 [4]	550	550	550	550
Washed						
MINERAL FUELS AND RELATED MATERIALS						
Lignite	thousand metric tons	8,106 [4]	8,640 [4]	8,360 [4]	8,500 [4]	8,200 [4]
Petroleum, refinery products	thousand 42-gallon barrels	6,000	6,000	6,000	6,200	7,000

[r]Revised. -- Zero.

[1]Estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through November 2006.

[3]In addition to commodities listed, common clay also is produced, but available information is inadequate to make reliable estimates of output.

[4]Reported figure.

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TABLE 8
MACEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity[e]
Cement	Azbestcementa "Usje" Preduzece za Proizvodnju Cementa	Plant at Skopje	2,190
Chromite, concentrate	Jugohrom, Hemijsko-Elektrometakurski Kombinat (HEK)	Concentrator at Radusa	150
Copper ore	Bucim, Rabotna Organizacija za Rudarstvo i Metalurgija za Baker	Mine and mill at Bucim, near Radovis	4,000
Ferroalloys	Jugohrom, Hemijsko-Elektrometalurski Kombinat (HEK)-Jegunovce	Plant at Jegunovce	80
Iron ore	Skopje, Rudnici i Zeljezarnica Skopje	Mines at Tajmiste, Demir Hisar, and Damjan	1,000
Lead metal	Zletovo, Topilnica za Cink i Olovo	Imperial smelter at Titov Veles	40
Do.	do.	Refinery at Titov Veles	40
Lead-zinc, concentrate	Sasa–Makedonska Kamenica Mine (Sase, Rudnici za Olovo i Cink)	Mill near Kamenica	65
Lead-zinc ore	Prepobotuvacki, Kombinat Zletovo-Sasa: Sase, Rudnici za Olovo i Cink	Mine near Kamenica	300
Do.	Zletovo, Rudnici za Olovo i Cink	Mine and mill near Probistip	700
Nickel:[1]			
Ore	Feni Industries	Mine and opencast mine near Kavadarci	2,300
Metal	do.	Ferronickel plant at Kavadarci	7
Steel, crude	Makstil A.D. Skopje (Duferco Group, 54.4%)	Plant at Skopje	260
Zinc metal	Zletovo, Topilnica za Cink i Olovo	Imperial Smelter plant and refinery at Titov Veles	65

[1]Nickel in ferronickel.

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TABLE 9
SERBIA AND MONTENEGRO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Gross weight:						
Alumina, calcined		200,660	237,396	239,739	245,005 r	250,000
Bauxite		610,000	612,000	540,000	610,000 r	600,000
Metal, ingot, primary and secondary		100,176	111,689	116,744	107,000	117,000
Copper:						
Mine and concentrator output:						
Ore:						
Gross weight	thousand metric tons	7,123	7,968	5,714 r	5,495 r	6,000
Cu content		33,000	38,000	28,000	25,000	27,000
Concentrate:						
Gross weight		150,000 e	185,000 e	102,000	95,000	97,000
Cu content		31,000	36,900	26,400	24,000	26,100
Metal:						
Blister and anodes:						
Primary		24,000	36,000	14,000 r	12,000 r	16,300
Remelted		35,000 e	6,700 r, e	3,600	1,100 r	6,000
Total		59,000	42,700 r	17,600 r	13,100 r	22,300
Refined:						
Primary		22,465	26,897	9,000	12,000	23,300
Remelted		10,000 e	9,000 e	5,029	7,000 r	6,000
Total		32,465	35,897	14,029	19,000 r	29,300
Gold, refined	kilograms	--	858	363	400	400
Iron and steel, metal:						
Pig iron		461,000	485,000	635,000	994,000 r	1,000,000
Crude steel		598,000	596,000	569,199 r	1,167,000 r	1,286,000
Semimanufactures		801,000	877,000	926,000	950,000	950,000
Lead:						
Mine and concentrate output:						
Ore:						
Gross weight (Pb-Zn ore)		531,000	284,000	183,000	180,000	185,000
Pb content e		5,800	3,100	2,000	2,000	2,000
Concentrate: e						
Gross weight		16,000	8,500	5,500	5,500	5,500
Pb content		5,200	2,800	1,800	900 r	1,800
Metal, primary and secondary, refined		--	200	500	800	--
Magnesium, metal e		1,500 r	1,800	1,500	1,500	1,500
Platinum-group metals: e						
Palladium	kilograms	10 r	10	8	8	8
Platinum	do.	1 r	1	1	1	1
Selenium	do.	14,000	15,000 e	7,000	7,000 e	7,000 e
Silver	do.	5,745	6,838	2,028	2,000 e	2,000 e
Zinc:						
Zn content of Pb-Zn ore e		15,000	9,300	7,500	7,500 r	8,500
Concentrator output, gross weight e		17,500	20,300	5,000	7,000 r	8,000
Zn content of concentrate e		5,988	6,900	1,900 r	2,000 r	3,000
Refined		13,467	1,478	62	4,000 r	20,000
INDUSTRIAL MINERALS						
Asbestos fiber, all grades		194	372	111	110 e	110 e
Cement	thousand metric tons	2,418	2,396	2,075	2,240	2,200
Clays:						
Ceramic clay e		30,000	30,000	25,000	25,000	25,000
Fire clay: e						
Crude		30,000	30,000	30,000	30,000	30,000
Calcined		10,000	10,000	10,000	10,000	10,000
Kaolin, crude		60,900	95,622	99,460	95,000 e	95,000 e
Feldspar, crude		4,451	7,813	3,045	3,500 e	3,500 e
Gypsum, crude		58,045	54,937	42,261	45,000 e	45,000 e
Lime	thousand metric tons	467	468	402	400 r	400

See footnotes at end of table.

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TABLE 9—Continued
SERBIA AND MONTENEGRO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS—Continued						
Magnesite:						
Crude	thousand metric tons	36	33	24	20	20
Caustic calcined[e]		2,500	2,500	2,000	1,500	1,500
Mica, all grades		303	426	185	200	200
Nitrogren, N content of ammonia		65,900 [r]	65,000 [r,e]	60,000 [r]	60,000 [r,e]	60,000 [e]
Pumice and related volcanic materials, volcanic tuff[e]		100,000	100,000	100,000	100,000	100,000
Salt, all sources		61,646	42,243	78,271	75,000	75,000
Sand and gravel, excluding glass sand	thousand cubic meters	1,967	2,074	1,507	1,500	1,500
Silica:						
Quartz sand		301,402	258,801	260,880	260,000	260,000
Glass		106,000	104,000	65,000	80,000	80,000
Sodium compounds:						
Caustic soda		7,584	6,787	7,450	7,000 [e]	7,000 [e]
Sodium sulfate[e]		800	800	800	800	800
Stone, excluding quartz and quartzite, dimension, crude:						
Ornamental	square meters	84,000	103,000	69,000	70,000	70,000
Crushed and broken, n.e.s.[e]	thousand cubic meters	3,000	3,000	2,000	2,000	2,000
Other, stone blocks[e]	cubic meters	1,000	1,000	500	500	500
Sulfur, byproduct:[e]						
Metallurgy	thousand metric tons	100	75	40	50	50
Petroleum	do.	1	1	1	1	1
Total	do.	101	76	41	51	51
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	70	70	54	50	50
Brown	do.	376	423	397 [r]	352 [r]	350
Lignite	do.	32,936	32,995	34,543	35,192	35,000
Total	do.	33,382	33,488	34,994 [r]	35,594 [r]	35,400
Natural gas, gross production	million cubic meters	506	400	364	317	320
Petroleum:						
Crude, as reported	thousand metric tons	746	682	671	652	650
Refinery products	do.	1,793	2,369	2,380	2,300 [e]	2,300 [e]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.
[1]Table includes data available through November 2006.
[2]In addition to commodities listed, common clay and diatomite also are produced, and tellurium may be recovered as a copper refinery byproduct, but available information is inadequate to make reliable estimates of output.
[3]Reported figure.

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TABLE 10
SERBIA AND MONTENEGRO: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Alumina		Kombinat Aluminijuma Titograd	Plant at Titograd, Montenegro	200.
Aluminum		do.	Smelter at Titograd, Montenegro	100.
Antimony, ores and concentrates		Zajaca, Rudarsko Tapionicarski Bazen	Mines and mills near Zajaca, Serbia	80.
Do.		do.	Mines and mill at Rajiceva Gora, Serbia	300.
Antimony, metal		do.	Smelter at Zajaca, Serbia	4.
Bauxite		Rudnici Boksita, Niksic	Mines in Montenegro at Kutsko Brdo, Zagrad, Biocki Stan, Durakov Dol, and other locations	650.
Cement		Becinska Fabrika Cementa	Plant at Beocin, Serbia	2,031.
Do.		Fabrika Cementa Novi Popovac	Plant at Popovac, Serbia	1,613.
Coal:				
Bituminous		Ibarski Rudnici Kamenog Uglja	Mines at Jarando and Usce, near Baljevac na Ibru, Serbia	250.
Lignite		SOUR Kolubara, Rudarsko Energetsko Industrijski Kombinat, RO	Opencast mines: Polje B and Polje D	10,000.
Do.		Kolubara Povrsinski Kopovi	Tamnavski Kopovi (also known as Kolubarski Rudnici Lignita), near Vreoci, Serbia	14,000.
Do.		SOUR Elektroprivreda Kosova, RO Kosovo, Proizvodnja Separacija i Transport Uglja	Opencast mines: Dobro Selo and Belacevac, near Obilic, Serbia	2,000.
Copper		Rudarsko Topionicki Bazen Bor (RTB Bor)	Smelter at Bor, Serbia	180.
Do.		do.	Electrolytic refinery at Bor, Serbia	180.
Do.		do.	Mine and mill at Bor, Serbia	5,000 ore.
Do.		do.	Mine and mill at Majdanpek, Serbia	15,000 ore.
Do.		do.	Mine and mill at Veliki Krivelj, Serbia	8,000 ore.
Lead, metal		Rudarsko-Metalursko-Hemijski Kombinat za Olovo i Cink Trepca (Trepca)	Smelter at Zvecan, Serbia	180.
Do.		do.	Refinery at Zvecan, Serbia	90.
Lead-zinc ore		do.	Mines at Ajvalija, Kopanaonik, Badovac; Trepca, Blagodat, Lece; Veliki Majdan, Tisovak; and Kisnica, Rudnik, Suplja Stijena	5,000.
Do.		do.	Mills at Kriva Feja, Lece, Rudnik, Badovac, Leposavic, Zvecan, and Maravce, Suplja Stijena	3,160.
Do.		Hemijska Industrija Zorka: Brskovo, Rudnici Olova i Cinka	Mine at Brskovo, Montenegro	500.
Do.		Veliki Majdan Rudnik Olova i Cinka	Mine at mill near Krupanj, Serbia	250.
Magnesite, concentrate		Rudnici Magnezita "Sumadija"	Mine and plant at Sumadija, 20 kilometers northwest of Cacak, Serbia	120.
Do.		Rudnik i Industrija Magnezita "Strezovce"	Opencast mine at Beli Kamen, Strezovce, near Itiova Metrovica, Serbia	300.
Do.		do.	Sinter plant at Strezovce	40.
Do.		Magnohrom, Rudnik Magnezita "Magnezit"	Mine at Bela Stena, Baljevac na Ibru, Serbia	30.
Natural gas	million cubic feet	Naftaplin (Naftagas), RO za Istrazivanje, i Prozvodnju Nafte i Gasa	Natural gasfields in Serbia Kinkinda and others	30,000.
Petroleum:				
Crude	thousand 42-gallon barrels per day	Naftagas, Naftna Industrija	Oilfields in Serbia: Kikinda and others	30.
Refined	do.	Naftagas, Naftna Industrija: Rafinerija Nafte Pancevo	Refinery at Pancevo, Serbia	110.
Do.	do.	Rafinerija Nafte Novi Sad	Refinery at Novi Sad, Serbia	28.
Pig iron		U.S. Steel Serbia	Blast furance at Smederevo, Serbia	720.
Steel, crude		do.	Plant at Smederevo, Serbia	2,200.
Do.		HK Zeljezara Niksic AD	Plant at Niesic, Montenegro	300.
Zinc, metal		Rudarsko Metalursko Hemijski Kombinat Olova i Cinka Trepca, Metalurgija Cinka	Electrolytic plant at Titova Metrovica, Serbia	40.
Do.		Hemijska Industrija Zorka	Electrolytic plant at Sabac, Serbia	40.

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TABLE 11
SLOVENIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity[3]		2001	2002	2003	2004	2005
METALS						
Aluminum, ingot, primary		76,632	87,600	109,800	120,666	138,500
Iron and steel, metal:						
Ferroalloys:						
Ferrosilicocalcium[e]		100	100	--	--	--
Ferrosilicon[e]		9,000	9,000	9,000	9,000	9,000
Crude steel from electric furnaces		462,000	481,000	543,000	548,000	585,000
Semimanufactures		450,000	400,000 [e]	594,000	621,000	638,939
Lead, refined, secondary		15,400	15,400	15,400	16,000	15,400
INDUSTRIAL MINERALS						
Cement[e]	thousand metric tons	1,300	1,250	1,300	1,300	1,300
Clays:						
Bentonite		3,738	4,122	4,000 [e]	4,000 [e]	4,000 [e]
Ceramic clay, crude		2,500 [e]	2,000 [e]	2,261	1,819	1,800 [e]
Lime	thousand metric tons	1,434	1,636	1,500 [e]	1,500 [e]	1,500 [e]
Pumice and related materials, volcanic tuff[e]		40,000	40,000	40,000	40,000	40,000
Quartz, quartzite, glass sand[e]		200,000	200,000	200,000	200,000	200,000
Salt, all sources		107,755	128,212	125,000 [e]	125,000 [e]	125,000 [e]
Sand and gravel, excluding glass sand	thousand metric tons	11,510	10,897	11,000 [e]	11,000 [e]	11,000 [e]
Stone, excluding quartz and quartzite, crude:						
Dimension		45,000 [e]	6,858	12,603	10,667	15,262
Other[e]	cubic meters	10,000	10,000	10,000	10,000	10,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown coal	thousand metric tons	685	639	608	611	594
Lignite	do.	3,448	4,048	4,222	4,198	3,945
Natural gas	thousand cubic meters	6,100	6,000 [e]	4,900	5,040 [r]	4,335
Petroleum, crude		700 [e]	763	482	344	298

[r]Revised. -- Zero.

[1]Estimated data are rounded to no more than three significant digits.

[2]Table includes data available through November 2006.

[3]In addition to commodities listed, common clay, coke, and petroleum products also were produced, but available information is inadequate to make reliable estimates of output.

TABLE 12
SLOVENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Alumina	KidriçevoTalum d.o.o.	Plant at Kidricevo	120
Aluminum	do.	Smelter at Kidricevo	72
Cement	Salonit Anhovo	Plant at Anhovo	1,120
Coal:			
Brown	SOZC, Rudarsko Energetski Kombinat E. Kardelj	Mines: Sasavski Rudnici at Trbovlje, Hrastnik, Ojstro, Senovo, and Kanizarnica	1,300
Lignite	Rudarsko Energetski Kombinat Velenje, RO Rudnik Lignita-Velenje	Mine at Velenje	5,000
Lead metal	Rudnik Svinca in Topilnica, Mezica	Smelter at Mezica	35
Do.	do.	Refinery at Mezica	30
Petroleum, refined	Industrija Nafte d.d. Zagreb (INA) Rafinerija Nafte Lendava	Refinery at Lendava	16
Pig iron	Zdruzeno Podjetje Slovenske Zelezarne	Two blast furnaces at Zelazara Jesenice	300
Do.	Zelezara Store	Electric reduction furnaces at Store pri Celju	290
Steel, crude	Slovenske Zelezarne	Plant at Jesenica	400
Do.	do.	Plant at Ravne	162
Do.	do.	Plant at Store	140

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THE MINERAL INDUSTRIES OF BELGIUM AND LUXEMBOURG

By Harold R. Newman

BELGIUM

Belgium has a highly developed market economy and is located at the heart of one of the world's most highly developed industrialized regions. The country had diversified industrial and commercial bases. Belgium also had an excellent transportation infrastructure of canals, highways, ports, and railways that it had developed to integrate its industry with that of its neighbors.

Mining was less important than in the past. In 2005, Belgium had a well developed industrial minerals sector and was a producer of industrial materials, such as carbonates, and construction materials, such as dolomite, limestone, and silica sand. The trading of diamond and the processing of minerals and metals were the main activities in the mineral industry.

Belgium has an area of 30,530 square kilometers (km^2) and borders France, Germany, Luxembourg, the Netherlands, and the North Sea. It is one of the smallest countries in Europe with an east-west extent of 290 kilometers (km) and a north-south extent of 235 km (U.S. Central Intelligence Agency, 2006§[1]).

In 2005, Belgium's gross domestic product (GDP) based on purchasing power parity was $325 billion, and the per capita income was $31,244. The annual growth rate was 2.5% in real terms. The unemployment rate was 8.4%. The country's GDP was dominated by a very large service sector that accounted for more than 70% of the GDP (International Monetary Fund, 2006§).

The mineral-processing industry was a significant contributor to the Belgian economy in 2005. The refining of copper, zinc, and minor metals, and the production of steel were the leading mineral industries in Belgium. The processing and recovery of nonferrous metals were carried out in large-scale high-technology plants. In terms of capacity, Europe's leading electrolytic copper and zinc refineries and one of its leading lead refineries were located in Belgium. The country was also a producer of cadmium, germanium, selenium, and tellurium as byproducts from base metals smelting and refining operations, and its chemical industry led the world in the production of cobalt and radium salts (Link2exports, 2005§).

Production of mineral commodities generally remained stable during 2005 (table 1). Table 2 lists the principal mining and mineral-processing facilities in Belgium with their locations and capacities.

Environmental programs and policies in Belgium were the responsibility of the Direction Générale Environnement (Directorate General of the Environment) and its comparable departments in Flanders and Wallonia, which were two separate regions of the country. Environmental programs ranged from treating oil effluent to reducing air-polluting emissions. The environment was exposed to intense pressures from human activities—urbanization, a dense transportation network, and extensive animal breeding and crop cultivation. Natural hazards included flooding along rivers and in areas of reclaimed coastal land (U.S. Central Intelligence Agency, 2006§).

Belgium was heavily reliant on international trade. The Belgium-Luxembourg Economic Union (BLEU) was involved in the parity of currency, integrated foreign trade (including statistics), a balance-of-payment account, and a joint central bank. International trade data was covered in the context of BLEU and, as such, covered the exports, reexports, and imports of both Belgium and Luxembourg. Belgium, the Netherlands, and Luxembourg (BENELUX) comprise the BENELUX custom unit. The BENELUX encompasses a population of 25 million, and 22% of U.S. exports to the European Union (EU) go to the BENELUX. Exports accounted for more than 74% of Belgium's GDP, which made it one of the highest per capita exporters in the world (U.S. Commercial Service, 2005§).

In 2005, Belgium's exports and reexports totaled $333.5 billion and imports totaled $319.8 billion, of which trade with other EU countries accounted for $254.8 billion of the exports and $229.2 billion of the imports. Germany was Belgium's top customer; the United States was fifth (Belgium Foreign Trade Agency, 2006§).

N.V. Umicore S.A. was an international metals and materials group. Its activities were centered on four business areas: advanced materials, precious metals products and catalysts, precious metals services, and zinc specialities. In early 2005, Umicore decided to move part of Umicore's copper operations into a new company called N.V. Cumerio S.A. The intention to spinoff Umicore's copper activities into a separate listed company was in line with Umicore's strategy to focus on specialty materials and follows the successful turnaround of Umicore's copper division, which included the Olen refinery. Umicore has made significant investment in its copper division in recent years, which has resulted in Cumerio having low-cost state-of-the-art assets (Mining Journal, 2005).

The Central Bank of Belgium announced that it had sold 30 metric tons (t) of gold in July and August. These gold sales took place within the framework of the Central Bank Gold Agreement that was concluded between 15 European central banks. The bank reported that it had 227.7 t of gold remaining after the sale and that there was no plan to sell any more gold in 2005 (Mining News, The, 2005§).

Mittal Steel N.V. announced that it had made a $23 billion bid for its closest rival, Arcelor S.A., which would create the world's first 100-million-metric-ton (Mt)-plus steel producer. A combination of the two companies would give Mittal control of an estimated 11% of the world's annual output. Arcelor considered the bid as hostile and was mounting a defense against the takeover (Glader and Singer, 2006).

[1]References that include a section mark (§) are found in the Internet References Cited sections.

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The new steel plant built on the site of Ugine & ALZ Carinox became operational in late 2005. The facility, with a capacity of 1 million metric tons per year (Mt/yr) of stainless steel, provided Ugine & ALZ with an integrated plant that formed the basis of the company's upstream production complex. The plant was built in 26 months and represented an investment of $294 million; it replaced two smaller, nonintegrated plants (Arcelor S.A., 2005§).

Umicore stated that it would reduce zinc production by 130,000 metric tons per year to concentrate on value-added zinc products. This reduction involved the company's smelters at Belen in Belgium, and Auby and Calais in France. The company said the reorganization was necessary to safeguard the competitive strength of its operations. Apart from zinc metal, Umicore produced high-value-added zinc alloys and zinc-based chemicals and had a zinc recycling business (Mining Journal, 2005).

Cimenteries CBR S.A. (CBR) produced and marketed a wide range of cement for building, civil engineering, and public works. CBR's five production plants produced 3.2 Mt/yr of cement. As part of its plan to optimize production, CBR has invested a total of $136 million in its Ghent and Lixhe plants. Also, CBR has reduced its energy consumption during the past few years. Since 1973, the amount of fossil fuel used to produce clinker has been cut by 50% by the increased use of renewable sources of energy and energy-efficient technological investments (Cimenteries CBR S.A., 2005§).

The diamond district of Antwerp, which comprised 4 exchanges and 1,500 diamond companies, was the most important diamond distribution center in the world. Exports of polished diamond from January thru November 2005 (the latest date for which data were available) were 8.8 million carats with a value of $8.3 billion; imports of polished diamond for the same period were 8.8 million carats with a value of $7.6 billion The United States remained the most important export market for cut diamond. The diamond sector accounted for 8% of Belgium's total exports (Diamond High Council, 2005§)

Antwerp's diamond business, including all grades, had $34 billion in trade, accounted for 7% of Belgium exports, and remained the dominant trading center for newly mined stones. The Diamond High Council was making efforts to strengthen ties with diamond-producing countries and large mining companies to ensure the flow of uncut diamond. Eight out of every ten rough diamonds in the world are handled in Antwerp (Resource Investor, 2005§).

Belgium, which has been an important producer of marble for more than 2,000 years, was recognized for the diversity and quality of its dimension stone. A dark blue-gray crinoidal limestone, which is referred to as "petit granit," was one of the most important facing stones that the country produced. All the marble quarries are located in Wallonia. Red, black, and gray are the principal color ranges of the marble, most of which was exported.

N.V. Nederlande Gasunie and N.V. Nuon were to invest $425 million in building a 180 million-cubic-meter salt-cavern natural gas storage facility at Zuidwending. Controlled salt mining will create four subterranean caverns, in which the natural gas will be stored. The caverns will lie at a depth of between 1,000 meters (m) and 1,500 m so that the gas will be stored more than 1,000 m deep. Natural gas has been stored in neighboring countries for many years (Platts, 2006§).

The four ports in Flanders (Antwerp, Ghent, Ostend, and Zeebrugge), which are all within 100 km of each other, were leading players in international and intra-European cargo handling. The seaport of Antwerp was a particularly important link in the chain of international trade. Antwerp was the leading port for steel products; the 2d ranked port in Europe after Rotterdam, the 4th fourth ranked port in the world, and the 10th ranked port in the world for container traffic (Antwerp Municipal Port Authority, 2006).

Outlook

Belgium is expected to remain a significant mineral processor and major diamond trader in the world. It is also expected to continue to be a leading player in international and intra-European cargo handling.

References Cited

Antwerp Municipal Port Authority, 2006, Annual report 2005: Antwerp Belgium, Municipal Port Authority, March, p. 1.

Glader, Paul, and Singer, Jason, 2006, Mittal bids $23 billion for Arcelor: The Wall Street Journal, January 28-29, p. A3, A6 .

Mining Journal, 2005, Umicore to demerge copper business: Mining Journal, February 25, p. 14.

Internet References Cited

Arcelor S.A., 2005 (September 20), Start-up of the Ugine & ALZ Carinox steel plant, accessed April 17, 2006, at URL http://www.arcelor.com/index.php.

Belgium Foreign Trade Agency, 2006 (March), Belgium—Recent developments of exports/imports, accessed April 5, 2006, at URL http://www.abh-ace.org/import_en/infor-center/trade-statistics/monthly-figures/2005/evol1.

Cimenteries CBR S.A., 2005, CBR—Member of the Heidelberg Group, accessed April 18, 2006, at URL http://www.cbr.be?code/page.cfm?id=262.

Diamond High Council, 2005, Key figures, accessed January 31, 2006, at URL http://www.hrd.be/index.php?id=51.

International Monetary Fund, 2006 (April), Belgium, World Economic Outlook Database, accessed April 21, 2006, at URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcoutm.cfm.

Link2exports, 2005, Belgium, accessed April 5, 2006, at URL http://www.link2exports.co.uk/countryprofiles/regions.asp.

Mining News, The, 2005 (October 8). Belgium's central bank sells 30 tonnes of gold, accessed April 10, 2006, at URL http://www.theminingnews.org/news.cfm?newsID=1181.

Platts, 2006 (January16), Gasunie, Nuon to invest $425 million in new Groningen salt caverns, accessed January 19, 2006, at URL http://www.platts.com/natural gas/news/8247986.xml.

Resource Investor, 2005 (May 27), Diamond centers may take shine off Antwerp, accessed May 27, 2005, at URL http://www.resourceinvestor.com/pebble.asp.

U.S. Central Intelligence Agency, 2006 (January), Belgium, The World Factbook 2006, accessed April 4, 2006, at URL http://www.cia.gov/cia/publications/factbook/geos/be.html.

U.S. Commercial Service, 2005, Belgium, Country Commercial Guide, accessed March 5, 2006, at URL http://www.buyusa.gov/Belgium/en/166.htm.

LUXEMBOURG

In 2005, Luxembourg's mineral industry comprised mainly minerals information systems, mineral trading, and raw materials processing. Mining in Luxembourg was represented

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by small industrial mineral operations that produced material for domestic consumption. These minerals included dolomite, limestone, sand and gravel, and slate (table 1). Luxembourg's principal producers of industrial mineral products are listed in table 2.

Luxembourg has an area of 2,586 km^2 and had a population of 468,600. In 2005, the country's GDP based on purchasing power parity was $30.7 billion, and the per capita income was $66,820. The annual growth rate was 1.3% in real terms, the inflation rate was 2.4%, and the unemployment rate was 4.8% (International Monetary Fund, 2005§).

As a member of the BLEU, trade statistics for Luxembourg are inextricably linked with those of Belgium and, therefore, cannot be listed individually. The iron and steel industry was Luxembourg's most important mineral industry sector; steel was the country's main export commodity.

Acieries Reunies de Burbach-Eich Dudelange (ARBED) dominated the country's mineral industry. The company was the major producer of crude steel, pig iron, and stainless steel, all of which were produced from imported material.

The Arcelor Group, which was the world's leading steel company in 2005 with a turnover of $39.8 billion and the number one steel producer in Europe, inaugurated a new section mill—the Beval medium section mill at Arcelor's Esch-Belval site. This rolling mill represented an investment of more than $207 million and was one of the largest investments carried out by Arcelor since its creation in 2002. The mill has a production capacity of 800,000 t/yr and would produce light and medium-sized sections, U channels, and angle sections (Arcelor Group, 2005§).

Outlook

Luxembourg is expected to continue to be a producer and exporter of steel. The industrial mineral production will be limited to domestic consumption.

Internet References Cited

Arcelor Group, 2005, Steel solutions, accessed April 17, 2006, at URL http://www.arcelor.com/index.php?lang=en&page=49&tbo=105.
International Monetary Fund, 2005 (September), Luxembourg, World Economic Outlook Database, accessed April 4, 2006, at URL http://www.imf.org/external/pubs/ft/weo/2005/02/data/dbcoutm.cfm.

Major Sources of Information

Institute National de Statistiques
Rue de Louvain 44
1000 Brussels, Belgium
Service Geologique de Belgique
Rue Jenner 13
1040 Brussels, Belgium
Service Central de la Statistique et des Études Economiques (STATEC)
6 Boulevard Royal
2013 Luxembourg

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TABLE 1
BELGIUM AND LUXEMBOURG: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2001	2002	2003	2004	2005[e]
BELGIUM[2]						
Metals:						
Aluminum, secondary including unspecified metals[e]		500	500	300	300	250
Arsenic, white[e]		1,500	1,500	1,200	1,200	1,000
Bismuth, metal[e]		700	700	600	500	500
Cadmium, primary		1,236	117 [e]	100	--	--
Cobalt, primary[3]		1,090 [e]	1,135	1,704	2,947 [r]	3,298 [4]
Copper:						
Blister, secondary		138,200	125,900	117,500	140,000	120,000
Unwrought, total, primary and secondary including alloys[e]		475,000	483,978 [4]	485,000	465,600 [r]	475,000
Refined, primary and secondary including alloys[e]		425,000	423,000	425,000	383,000 [r]	382,900 [4]
Iron and steel:						
Pig iron	thousand metric tons	7,732	8,053	8,000 [e]	8,000	8,000
Steel:						
Crude	do.	10,763	11,495	11,128	11,698	10,422 [4]
Hot-rolled products	do.	12,770 [4]	12,000	12,000	12,000	12,000
Lead, refined, secondary		100,000	88,000	65,000	62,000 [r]	63,400 [4]
Selenium[e]		200	200	200	200	200
Tin, metal, secondary including alloys		8,000 [e]	8,900 [r]	7,700 [r]	8,900 [r]	7,800 [4]
Zinc:[e]						
Slab:						
Primary		225,000	239,000	244,000 [r]	257,000 [r]	222,000
Secondary, possibly remelted zinc		67,000	70,000 [r, 4]	42,000 [r]	46,000	40,000
Total		292,000	309,000 [r]	286,000 [r]	303,000 [r]	262,000
Powder		25,000	25,000	20,000	20,000 [r]	20,000
Industrial minerals:						
Barite[e]		30,000	30,000	30,000	30,000	30,000
Cement, hydraulic	thousand metric tons	8,064	8,152	7,469 [r]	7,379 [r]	7,400
Clay, kaolin[e]	do.	387 [r]	411 [r]	429 [r]	459 [r]	460
Lime and dead-burned dolomite, quicklime[e]	do.	1,800	1,800	1,800	1,800	1,800
Nitrogen, N content of ammonia	do.	860 [e]	842	874	857	860
Sodium sulfate[e]	do.	250	250	250	250	250
Stone, sand and gravel:[e]						
Calcareous:						
Alabaster		1,200	1,200	1,200	1,200	1,200
Dolomite	thousand metric tons	3,500	3,500	3,500	3,500	3,500
Limestone	do.	30,000	30,000	30,000	30,000	30,000
Marble:						
In blocks		300	300	300	300	300
Crushed and other	cubic meters	100	100	100	100	100
Petit granite, Belgian bluestone:						
Quarried	thousand cubic meters	1,200	1,200	1,200	1,200	1,200
Sawed	do.	100,000	100,000	100,000	100,000	100,000
Worked	do.	15,000	15,000	15,000	15,000	15,000
Crushed and other	do.	800,000	800,000	800,000	800,000	800,000
Porphyry, all types	thousand metric tons	4,000	4,000	4,000	4,000	4,000
Quartz and quartzite		500,000	500,000	500,000	500,000	500,000
Sandstone:						
Rough stone including crushed	thousand metric tons	2,400	2,400	2,400	2,400	2,400
Paving		14,000	14,000	14,000	14,000	14,000
Sand and gravel:						
Sand:						
Construction	thousand metric tons	8,500	8,500	8,500	8,500	8,500
Foundry		500,000	500,000	500,000	500,000	500,000
Dredged	thousand metric tons	2,000	2,000	2,000	2,000	2,000
Glass	do.	1,800	1,800	1,800	1,800	1,800
Other	do.	2,800	2,800	2,800	2,800	2,800
Gravel, dredged	do.	5,000	5,000	5,000	5,000	5,000

See footnotes at end of table.

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TABLE 1--Continued
BELGIUM AND LUXEMBOURG: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2001	2002	2003	2004	2005[e]
BELGIUM--Continued[2]						
Industrial minerals--Continued:						
Sulfur:[e]						
Byproducts:						
Elemental		230,000	225,000	225,000	225,000	225,000
Other forms		180,000	175,000	175,000	175,000	175,000
Total		410,000	400,000	400,000	400,000	400,000
Sulfuric acid, byproduct of petroleum	thousand metric tons	2,000	2,000	2,000	2,000	2,000
Mineral fuels and related materials:						
Carbon black[e]	do.	1,000	1,000	1,000	1,000	1,000
Coke, all types	thousand cubic meters	3,222	2,967	3,200 [e]	3,200 [e]	3,200
Gas, manufactured		342,572	339,807	340,000 [e]	340,000 [e]	340,000
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	7,592 [r]	7,600 [r]	7,264 [r]	9,000 [e]	9,000
Naphtha and white spirit[e]	do.	16,000	16,000	16,000	16,000	16,000
Gasoline	do.	46,428 [r]	48,801 [r]	49,567 [r]	50,000 [e]	50,000
Jet fuel	do.	15,075 [r]	16,279 [r]	16,097 [r]	18,000 [e]	18,000
Distillate fuel oil	do.	95,338 [r]	92,966 [r]	97,090 [r]	90,000 [e]	90,000
Refinery gas	do.	10,475 [r]	10,439 [r]	10,877 [r]	3,500 [e]	3,500
Residual fuel oil	do.	45,260 [r]	49,056 [r]	56,028 [r]	50,000 [e]	50,000
Bitumen[e]	do.	5,000	5,000	5,000	5,000	5,000
Other	do.	90,484 [r]	131,181 [r]	115,778 [r]	10,000 [e]	10,000
Refinery fuel and losses	do.	10,475 [r]	10,439 [r]	10,877 [r]	10,000 [e]	10,000
Total[e]	do.	342,000 [r]	388,000 [r]	385,000 [r]	262,000	262,000
LUXEMBOURG[5]						
Metals, steel:						
Crude	thousand metric tons	2,725	2,736	2,675	2,684	2,194 [4]
Semimanufactures	do.	2,974	2,800	2,800 [e]	2,800 [e]	2,600
Industrial minerals:						
Cement, hydraulic[e]		750,000 [4]	700,000	700,000	700,000	700,000
Gypsum and anhydrite, crude[e]		400	400	400	400	400
Phosphates, Thomas slag:[e]						
Gross weight		475,000	475,000	475,000	475,000	475,000
P_2O_5 content		70,000	70,000	70,000	70,000	70,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through March 2006.

[2]In addition to the commodities listed, Belgium produced a number of other metals and alloys, for which only aggregate output figures were available.

[3]Production reported by N.V. Umicore S.A. includes production from China and South Africa.

[4]Reported figure.

[5]Construction materials, such as dimension stone and sand and gravel, are also reproduced, but the amounts are no longer reported, and no basis exists for the formulation of reliable estimates of output levels.

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TABLE 2
BELGIUM AND LUXEMBOURG: STRUCTURE OF THE MINERAL INDUSTRIES IN 2005

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
BELGIUM				
Cadmium, metal	metric tons	N.V. Umicore S.A. (Sté. Générale de Belgique, 50.2%)	Balen	1,800
Cement		Major companies:	Plants:	8,400
Do.		Cimenteries CBR SA (Sté. Générale de Belgique)	Major plants at Lixhe, Mons/Obourg, Harmignies, Marchienne, and Ghent	3,200
Do.[1]		Ciments d'Obourg SA (Holcim Group)	Plants at Obourg and Thieu	2,800
Do.		Compagnie des Ciment Belge (Ciments Francais)	Plant at Gaurain-Ramecroix	2,400
Cobalt	metric tons	N.V. Umicore S.A. (Sté. Générale de Belgique, 50.2%)	Refinery at Olen	500
Copper		do.	Smelter at Antwerp-Hoboken	50
Do.		do.	Refinery at Olen	330
Do.		Metallo-Chimique NV	Smelter at Beerse	80
Dolomite		SA Dolomeuse (Group Lhoist)	Quarry at Marche les Dames	500
Do.		do.	Plant at Marche les Dames	750
Do.		SA de Marche-les-Dames (Group Lhoist)	Quarries at Namèche	3,000
Do.		do.	Plant at Namèche	3,000
Do.		SA Dolomies de Merlemont (Group Lhoist)	Quarry at Philippeville	100
Lead, metal		N.V. Umicore S.A. (Sté. Générale de Belgique, 50.2%)	Smelter at Antwerp-Hoboken	90
Do.		do.	Refinery at Antwerp-Hoboken	125
Limestone		Carmeuse S.A. (Long View Investment NV)	Mines and plant at Engis	1,850
Do.		do.	Mines and plant at Frasnes	450
Do.		do.	Mines and plant at Maizeret	850
Do.		do.	Mines and plant at Moha	800
Do.		SA Transcar (Royal Volker Stevin)	Mines and plant at Maizeret	850
Petroleum, refined	42-gallon barrels per day	Total S.A.	Refinery at Antwerp	268,000
Do.	do.	SA Esso NV	do.	239,000
Do.	do.	Nynas Petroleum NV	do.	125,000
Do.	do.	Belgian Refining Corp.	do.	80,000
Do.	do.	Petroplus Refining Antwerp NV	do.	55,000
Salt		Zoutman NV	Plant at Roeselare	200
Sand, silica		SRC-Sibelco SA	Mines and plants at Lommel, Mol, and Maasmechelen	500
Steel		Companies:	Of which:	14,000
Do.		Cockerill Sambre SA (Government of Wallonia, 80%)	Plants at Liège and Charleroi	(5,000)
Do.		Sidmar NV (Belgian Government 28.24%, and Arcelor Group, 71.76%)	Plant at Ghent	(3,960)
Do.		Usines Gustave Boël NV	Plant at La Louviere	(2,020)
Do.		Forges de Clabecq SA	Plant at Clabecq	(1,500)
Do.		SA Fabrique de Fer de Charleroi	Plant at Charleroi	(600)
Do.		ALZ NV	Plant at Genk-Zuid	(360)
Do.		New Tubemeuse (NTW) SA	Plant at Flemalle	(300)
Zinc, metal		N.V. Umicore S.A. (Sté. Générale de Belgique, 50.2%)	Smelter and refinery at Balen	450
LUXEMBOURG				
Cement		SA des Ciments Luxembourgeois (Acieries Reunies de Burbach-Eich-Dudelang, 50.2%, and Sté. Générale de Belgique, 25%)	Plant at Esch-sur-Alzette	450
Do.		Intermoselle SARL (Acieries Reunies de Burbach-Eich Dudelange, 33%)	Plant at Rumelange	1,000
Steel		Arcelor Group	Plants at Differdange, Dudelange, Esch-Belval, Esch-Schifflange	5,320

[1]Includes the capacity of the company SA Ciments de Haccourt.

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THE MINERAL INDUSTRIES OF CENTRAL EUROPE

CZECH REPUBLIC, HUNGARY, POLAND, AND SLOVAKIA

By Walter G. Steblez

The Czech Republic, Hungary, Poland, and Slovakia, which are the most economically dynamic countries of the former centrally planned economy areas of Europe and Central Eurasia, joined the European Union (EU) on May 1, 2004. The denationalization of the iron and steel sectors continued in the Central European region. Mining in these countries continued to undergo rationalization to meet market economy norms and had a much-reduced share in industrial production and gross domestic product than it had during the years of central economic planning when Government policies dictated mineral self-sufficiency at all costs.

CZECH REPUBLIC

The Czech Republic was an important Central European producer of heavy industrial goods manufactured by the country's toolmaking, machine building, and chemical industries. Steelmaking, the mining and processing of industrial minerals, and the production of construction materials continued to be of domestic and regional importance.

In 2005, the Czech Republic's real gross domestic product (GDP) increased by 6.1% compared with that of 2004. Based on purchasing power parity, the GDP in 2005 amounted to about $175 billion (International Monetary Fund. 2006§[1]). Industrial production increased by about 5.7% compared with that of 2004 (U.S. Central Intelligence Agency, 2005, p. 250). In 2005, the privatization of the iron and steel sector continued to be an important process in the country's mineral industry.

Government Policies and Programs

The Government continued programs of economic development that were consonant with the EU's criteria for newly admitted and applicant countries. The country's membership in The World Bank, the International Monetary Fund, the Organisation for Economic Co-operation and Development (OECD), and the World Trade Organization, as well as participation in the General Agreement on Tariffs and Trade, was largely an outcome of the Czech Republic's full orientation toward Western European political and economic values.

Three constituent Acts compose the country's mining law, which forms the foundation of the Government's mining and other mineral-related policies. These are Act No. 44/1988 Coll., on Protection and Use of Mineral Resources (the Mining Act), as amended; the Czech National Council Act No. 61/1988 Coll., on Mining Activity, Explosives, and State Mining Administration (Authority/Sedenka), as amended; and the Czech National Council Act No. 62/1988 Coll., on Geological Works, as amended. The Mining Act classifies minerals as either "reserved" or "unreserved". The "reserved" category refers to mineral deposits that, apart from immediate market considerations, are determined to be necessary for the development of the national economy (GEOFOND, 2004, p. 10, 11). Other provisions in the Mining Act (law) address issues of licensing and Federal and regional compliance with environmental regulations during the exploration and exploitation of mineral deposits and the reclamation of mined-out areas.

These regulations composed the environmental law of 1997 (Act No. 125/1997). The law became in force on January 1, 1998. The environmental law focuses on reducing the volume of waste, discreet collection of waste by category, and recycling. The law adopts the main provision of EU and OECD regulations and the Basel Convention. The catalog of wastes is compatible with the European Catalogue of Wastes of the EU.

Production and Trade

In 2005, the iron and steel industry constituted the major part of the country's metallurgical sector. The output of pig iron declined by almost 15% compared with that of 2004; crude steel production fell by about 12% (table 1). Trade data for 2004 (the latest year for which trade data were available), indicate that total imports of iron ore and concentrates amounted to about 7.6 million metric tons (Mt), or about 8% less than total imports of these commodities in 2003. Ukraine (about 61%) and Russia (about 33%) accounted for the major share of the Czech Republic's imports of iron ore and concentrate. Total imports of pig iron amounted to about 87,000 metric tons (t), which was an increase of about 21% compared with those of 2003; net imports of pig iron increased by 54%. Total exports of iron and steel scrap increased considerably to more than 1.4 Mt. Net exports of iron and steel scrap amounted to 898,000 t, which was an increase of about 43% compared with those of 2003 (GEOFOND, 2005, p. 28). Among industrial minerals, cement production increased by about 7.3% compared with that of 2004; sand and gravel and dimension stone output increased by about 15% and 5%, respectively. The output of diatomite rose by 15% compared with that of 2004. In 2005, dolomite production increased by more than 21%. Total dolomite imports in 2004 amounted to 441,823 t. Net imports of dolomite have been declining since 2000; net imports of dolomite in 2004 declined by about 20% compared with those of 2003 (GEOFOND, 2005, p. 209). Mined garnet output (pyrope ore) increased by about 2.4% compared with that of 2004 (table 1).

In 2005, the production of mineral fuels showed overall gains. Although the production of bituminous coal declined by about

[1]References that include a section mark (§) are found in the Internet Reference Cited sections.

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13% compared with that of 2004, the production of brown coal and lignite increased by almost 2% during this period (table 1). In 2004, imports of bituminous coal amounted to about 1.7 Mt; net exports were more than 4 Mt, or 9% less than in 2003. Natural gas production increased twofold compared with that of 2004; crude petroleum rose by about 2.3%. In 2004, total imports of natural gas amounted to 6,346 million cubic meters; about 79% of the total was imported from Russia. Russia also accounted for about 67% of the 6.5 Mt of petroleum that the Czech Republic imported in 2004 (GEOFOND, 2005, p. 89, 97, 107, 113).

Commodity Review

Metals

The Czech Republic's metals sector produced a broad range of base metals and semimanufactures from imported primary raw materials (ores and concentrates) and secondary materials (scrap). Although interest in gold mining continued in some parts of the Czech Republic, other metals reportedly were depleted. According to official data, most of the country's metallic mineral deposits as of December 31, 2000, were not economic.

All the raw materials consumed by the country's steel industry—iron ore and concentrate, and pellets and agglomerate—were imported. The steel industry operated eight steel plants with a collective capacity to produce almost 11 million metric tons per year (Mt/yr) of steel. The main steel producers were, in order of crude steel production capacity, Mittal Steel Ostrava (Nova Hut), Zelezarne Vitcovice (ZV, a subsidiary of the Evraz Group of Russia), Trinecke Zelezarny, and Poldi Hutte s.r.o. (a subsidiary of Scholz Edelstahl A.G.) and accounted for more than 87% of the country's total crude steel production capacity.

The privatization of the iron and steel industry and the increasing foreign investor interest in Czech ferrous metallurgy continued in 2005. In 2005, the Evraz Group of Russia acquired ZV for $285 million following competitive bidding that included bids from Mittal Steel (Reuters, 2005).

Industrial Minerals

The Czech Republic was well endowed with and produced a broad range of industrial minerals that met most domestic construction and chemical industry requirements, as well as those for export. The availability of these mineral resources at the recent (2000 to 2004) average rate of mining ranged from about 43 years for gem-grade pyrope ore to about 3,000 years for silica raw materials. Such corrective additives as clays, loams, loess, sands, and shales needed by the country's cement industry to regulate the content aluminum (Al_2O_3), iron (Fe_2O_3), and silicon oxides (SiO_2) during clinker production were reported to have a combined mine life of about 1,343 years. Limestone, kaolin, and glass sand (in order of deposit sizes) were the industrial minerals that had the largest resources suitable for exploitation (GEOFOND, 2005, p. 119-120; Reuters, 2005).

Mineral Fuels

Bituminous or hard coal occurs mainly in the Upper Silesian Basin. Of the resources in this region, only about 15% is located in the Czech Republic; the balance of the resources is located in Poland. In addition to bituminous coal, the Czech Republic differentiates two types of lower rank coal—brown coal and lignite. The Czech Republic's brown coal deposits are worked in the northwestern part of the country in the Bohemian brown coal basins. The major brown coal basins are found in the Krusne hory Mountains region and cover an area of 1,900 square kilometers (km^2). Coal also is mined in the Cheb, the Sokolov, and the Zitava basins. In 2005, the Government approved the privatization of Severoceske Doly AS, which was the leading coal producer in the country (Mining Journal, 2005a, b).

The Czech Republic's petroleum resources as of December 31, 2004, amounted to about 32.8 Mt, of which about 12.8 Mt was categorized as economic proven; 8.6 Mt as economic probable; and about 11.4 Mt as subeconomic. Total resources of natural gas were put at about 42 billion cubic meters (GEOFOND, 2005, p. 108, 116).

Outlook

The Czech Republic is expected to continue to rely on imports of natural gas and petroleum, given the country's limited resources of these commodities. Import reliance on base and precious metals also will continue, although demand is not expected to increase significantly owing to the fairly high technological level of the Czech Republic's fabrication and service sectors. In these sectors, material input per unit of output is expected to continue to decline from the high level of material input in production during the country's central economic planning period.

References Cited

GEOFOND, 2004, Mineral commodity summaries of the Czech Republic: Prague, Czech Republic, Ministry of the Environment of the Czech Republic, June, 210 p.

GEOFOND, 2005, Mineral commodity summaries of the Czech Republic: Prague, Czech Republic, Ministry of the Environment of the Czech Republic, June, 267 p.

Mining Journal, 2005a, CEZ Severoceske bid: London, United Kingdom, Mining Communications Ltd., July 15, p. 7.

Mining Journal, 2005b, Czech lignite sale: London, United Kingdom, Mining Communications, October 7, p. 3.

Reuters, 2005, Czechs seen rejecting Mittal offer for Vitcovice: London, United Kingdom, Reuters press release, July 11, 2 p.

U.S. Central Intelligence Agency, 2005, Czech Republic, *in* The world factbook: Washington, DC, U.S. Central Intelligence Agency, 698 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Czech Republic, World Economic Outlook Database, accessed September 1, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/weorept.aspx.

HUNGARY

Bauxite remained the only major nonfuel mineral produced in Hungary that was significant in terms of European mineral

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production. In 2004, Hungary maintained production of modest amounts of fossil fuels, industrial minerals, and metals. Despite substantial production of bauxite and alumina, Hungary's production of primary aluminum remained modest owing to limited domestic sources of energy. The production of coal, natural gas, and petroleum was sufficient to satisfy only about one-third of the country's annual energy needs.

In 2005, Hungary's real gross domestic product (GDP) increased by 4.1% compared with that of 2004. The GDP based on purchasing power parity amounted to $10,814 (International Monetary Fund, 2006§). The gross output (value) of industry in 2005 rose by about 7%; the value of mining and quarrying production, however, declined by 15% compared with that of 2004. In 2005, mining and quarrying represented 0.4% of the value of industrial production (Hungarian Statistical Office, 2007, p. 27).

Government Policies and Programs

The Government based its regulatory policies for mining and geologic survey work on provisions in the Mining Law of 1993 (Act No. XLVIII). Section 50 of the Mining Law was the basis for Governmental Decree No. 132/1993, which constitutes the legislative underpinning for the Hungarian Geological Survey. The Mining Law and related decrees and codes established the legislative bases for estimating reserves, determining environmental risks associated with mining, and providing the geologic and technical information needed to outline tender conditions.

Government agencies that were responsible for enforcing existing environmental protection laws and regulations included the Ministry of the Environment and Regional Planning (KTM) and the Hungarian Mining Office (MBH). The KTM was authorized to help only in the enforcement of existing environmental legislation prescribed by other ministries of the Government. With respect to mining and minerals, Hungary's Ministry of Industry and Commerce had the primary responsibility for establishing environmental regulatory standards. The chief responsibility of the MBH was that of a certifying agency, which could review only technical developmental and operational plans. These plans were required to include provisions that pertain to environmental protection and land restoration by responsible entities.

Production and Trade

In 2005, with the exception of alumina and bauxite, the output levels of metal ores and metals did not significantly vary from the output levels of 2004. To meet its economic requirements, Hungary was dependent on imports of most metals (ores and concentrates and billets). The production of cement and most industrial minerals in 2005 remained at about the output level of 2004. Hungary's output of fossil fuels was modest. In 2005, two-thirds of the country's mineral fuel and energy needs was imported. Overall, mineral fuel imports constituted about 10% of Hungary's total imports in 2005 (Hungarian Statistical Office, 2006 p. 20, 24). In terms of value, the production of basic metals and their semimanufactures declined by 2.2% compared with that of 2004; coke and refined petroleum and industrial minerals increased in value by 11.3% and 12.8%, respectively (Hungarian Statistical Office, 2007, p. 29).

Commodity Review

Metals

Bauxite mining and refining to alumina and manganese mining (manganese carbonate and oxide ores mined at Urkut) remained the only major metal mining and processing operations in Hungary. Gallium was produced as a byproduct of alumina refining.

Bakonyi Bauxitbanya Kft. [Bakony Bauxite Mines Ltd., a subsidiary of Magyar Aluminium Ltd. (MAL)] mined the bauxite in the Bakony District; Hungary's total resources of bauxite as of December 31, 2003, were estimated to be about 39 million metric tons (Mt) with a range of 47% to 52% Al_2O_3, 20% to 25% Fe_2O_3, and 6% to 8% SiO_2. About one-third of the bauxite was mined by the open pit method; the balance was mined underground at the Fenyofo and the Halimba Mines. In 2005, bauxite production declined by almost 17% compared with that of 2004 owing mainly to the closure of the Halimba III Mine (table 1; Magyar Aluminium Ltd., 2004, p. 6; Fodor and Kakas, 2005, p. 5). The new Halimba II bauxite mine, which had been put into operation in 2003, was designed to account for about one-third of the bauxite feedstock needed by domestic alumina refiners through 2009. To assure continued supplies of bauxite to its alumina refineries, MAL acquired ownership of three bauxite mines (formerly owned by Rudnici Boksita Jajce d.d.) in neighboring Bosnia and Herzegovina. In recent years, MAL has been the sole customer at the three Bosnian mines (Magyar Aluminium Ltd., 2004, p. 4).

In 2005, the output of mainly manganese carbonate ore by the Urkut Mine in the Bakony Mountains amounted to about 50,000 metric tons (t), which was about 2% more than that produced in 2004. Hungary's manganese ore was used to produce mainly blast furnace ferromanganese (table 3).

In 2005, Carpathian Gold Inc. of Toronto, Ontario, Canada, held discussions with Magyar Mining plc, a Hungarian exploration company, concerning the sale of Carpathian's gold exploration licenses and concessions in the Matra Mountains (about 133 square kilometers). Carpathian, however, continued to hold exploration licenses in Hungary at yearend at Fuzerradvany and Mad in the Tokay Mountains and at Kanazvar in the Matra Mountains northeast of Eger (Carpathian Gold Inc., 2005; 2006; Hungarian Statistical Office, 2007, p. 27).

Industrial Minerals

Hungary produced a broad range of industrial minerals that included aggregates, bentonite, kaolin, and perlite. Such industrial minerals as construction aggregates and cement continued to play an important role in Hungary's economy, especially in the modernization of the country's infrastructure. Highway construction planned through 2008 would continue to be an important element in the country's development of infrastructure.

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Mineral Fuels

In 2005, Hungary reported a decline of about 14% in crude petroleum production compared with that of 2004. Because of limited domestic resources (about 22 Mt), most petroleum (9 Mt) continued to be imported from Russia via the Friendship pipeline (table 3; Fodor and Kakas, 2005). Similarly, a substantial and increasing amount of natural gas was imported from Russia through Russia's gas-main network.

Hungary classifies its coals into three categories—hard coal (bituminous), brown coal, and lignite. Brown coal and lignite were mined, for the most part, to fuel the country's thermal electric power stations. Lignite was mined by open pit at the Bukkabrany and the Visonta Mines; the output from these mines was used entirely at the Matra electric powerplant. In 2005, the output of lignite declined by 4% compared with that of 2004; brown coal output declined by almost 43%. The output of bituminous coal ceased owing to exhaustion of reserves (table 3). Resources of bituminous coal and lignite and brown coal as of January 1, 2003, amounted to about 197 Mt and 3,100 Mt, respectively (Fodor and Kakas, 2005).

Outlook

Hungary will continue to rely on imports of natural gas and petroleum and most metals. The need to develop modern infrastructure that conforms to EU standards is expected to stimulate an increase in the consumption of construction-related industrial minerals and base metals.

References Cited

Carpathian Gold Inc., 2005, Carpathian Gold announces letter of agreement for the sale of its Hungarian subsidiaries: Toronto, Ontario, Canada, Carpathian Gold Inc. press release, February 17, 1 p.

Carpathian Gold Inc., 2006, Annual report 2006: Toronto, Ontario, Canada, Carpathian Gold, Inc., December 31, 35 p.

Fodor, Bela, and Kakas, Kristof, 2005, Hungary, *in* Mining annual review: London, United Kingdom, Mining Communications Ltd., 7 p.

Hungarian Statistical Office, 2006, Hungary in figures 2006: Budapest, Hungary, Hungarian Statistical Office, 35 p.

Hungarian Statistical Office, 2007, Statistical report: Budapest, Hungary, Hungarian Statistical Office, no. 10/2006, January, 49 p.

Magyar Aluminium Ltd., 2004, Magyar Aluminium 2003 annual report: Budapest, Hungary, Magyar Aluminium Ltd., 30 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Hungary, World Economic Outlook Database, accessed September 1, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/weorept.aspx.

POLAND

Poland is endowed with significant mineral resources, which include bituminous coal, copper and lead-zinc ores, salt, silver, and sulfur. In 2005, the country's reserve base of copper amounted to more than 5% of the world total (Edelstein 2007). Although world reserves of elemental sulfur in 2005 were not available, Poland's production of sulfur represented about 2% of total world output (Edelstein, 2007; Ober, 2007). Resources of coal and salt were considered to be of world significance; Poland's share of global resources of silver, lead, and zinc amounted to about 19%, 4%, and 3%, respectively. The latest available inventory of the country's mineral resources indicated net gains in geologically documented resources, mainly for bituminous coal, ceramic clays, coal bed methane, and sulfur (table 7).

In 2005, after Russia, Poland remained the leading producer of copper in Europe and Central Eurasia and remained among the top 10 world mine producers of copper (Edelstein, 2007). Poland also continued to be among the leading world producers of nitrogen (in ammonia), salt, silver, and sulfur. In Europe and Central Eurasia, the country was a significant producer of lead and zinc and a leading producer of lime. According to the most recent data available (2004), Poland accounted for about 3% of total world output of bituminous coal (Główny Urząd Statystyczny, 2006a, p. 500).

According to the International Monetary Fund, Poland's real gross domestic product (GDP) registered a growth of 3.4% compared with that of 2004; the per capita GDP based on purchasing power parity was estimated to be $12,994 (International Monetary Fund, 2006§). In 2005, the value of industrial production in constant prices increased by about 2.7% compared with that of 2004. During the same period, the value of output of the mining and quarrying sector in constant prices declined by almost 1% compared with that of 2004. In 2005, the value of the gross output of industry represented about 22% of the GDP; the value of mining and quarrying output was 2.3% of the GDP (Główny Urząd Statystyczny, 2006a; b, p. 454, 517).

Government Policies and Programs

The Government of Poland remained fully committed to privatizing the country's iron and steel industry. The total number of privately owned mining and quarrying enterprises reached 1,241 in 2005; there were 41 state-owned enterprises (Główny Urząd Statystyczny, 2006b, p. 43). Limited-liability companies, joint-stock companies, and partnerships constituted about 80%, 11%, and 4%, respectively, of the total mining enterprises. Steel trade issues and efforts to restructure and privatize Poland's steel industry continued to be among the leading mineral industry concerns during the year.

Production and Trade

In 2005, among the major metals, production increases were reported for copper (in ore, smelter and refined), gold, pig iron, and zinc (refined). Output shortfalls were reported for primary aluminum, lead (refined), crude steel, and hot-rolled semimanufactures (table 5). Among the major industrial minerals, production increases were reported for, among others, bentonite; production decreases were reported for cement (hydraulic), processed feldspar, lime, limestone, and salt. Compared with output levels in 2004, production declines in 2005 were reported for total coal, natural gas, and petroleum (table 5).

Although Poland was a leading European producer and processor of nonfuel minerals and mineral fuels, Poland still

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depended heavily on imports to meet demand. According to the Mineral and Energy Economy Research Institute of Poland's Academy of Sciences, of the 121 mineral commodities that were reviewed, 48 (40%) were in the category of total import dependence. Additionally, seven mineral commodities, or about 6% of the total, were in the category of import dependence of more than 50% (Ney and Smakowski, 2004, p. xi-xvii).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Poland's primary aluminum, which was produced in Konin by Aluminium Konin-Impexmetal S.A. (Konin), was based entirely on imported alumina. Alumina imports in 2004 (the latest year for which trade data were available) amounted to about 146,000 t and were chiefly used in primary aluminum production (table 8). A small amount (less than 15%) was used in the nonmetallurgical sphere (cement, chemicals, glass, and refractories).

In 2005, the production of primary aluminum metal declined by about 7% compared with that of 2004. Imports of aluminum and aluminum products in 2005 increased by about 6% during the same period. Exports of aluminum and aluminum products during the same period rose by about 16% (tables 8 and 9).

Cadmium.—Because of its association with sphalerite (zinc-iron sulfide), cadmium in Poland was produced as a byproduct of lead and zinc mining and processing operations in the Silesia-Cracow region. In 2005, refined cadmium production at Huta Cynku "Miasteczko Slaskie" increased by about 16% compared with that of 2004. Cadmium reserves as of December 31, 2003, amounted to 66,450 t (contained cadmium), of which 21,990 t (contained cadmium) were being worked (Ney and Smakowski, 2004, p. 65).

Copper.—All copper ore in Poland was mined by Kombinat Gorniczo Hutniczy Miedzi (KGHM) Polska Miedz S.A. (KGHM S.A.), which was a major world copper mining, beneficiation, smelting, and refining complex in the Lubin area. KGHM accounted for about 3.5% of world mine copper production in 2005. Using the room and pillar method, the ore was worked at the Lubin, the Polkowice-Sieroszowice, and the Rudna Mines at five deposits at depths that ranged from 600 to 1,200 meters (about 1,900 to 3,700 feet). Chalcocite was the principal mineral in the ore; smaller amounts of bornite and chalcopyrite also were present. The mineralization was mainly in a shale horizon, but extends also into overlaying carbonate and underlying sandstone layers. As of December 31, 2005, total copper resources amounted to almost 2.0 billion tons (Gt), which contained about 42 million metric tons (Mt) of copper. Reserves that were under exploitation amounted to about 1.6 Gt of ore that contained about 34 Mt of copper (table 7).

The Rudna Mine with a mining capacity of about 11 Mt/yr was the leading copper ore producer. The concentrator at Rudna processed Rudna ores, as well as some ores from the Polkowice-Sieroszowice Mine; its capacity was rated to produce about 700,000 t/yr of concentrate. Annual output by the Polkowice-Sieroszowice Mine and concentrator amounted to about 9.2 Mt of ore and 450,000 t of concentrate. The Lubin Mine accounted for about 7.5 Mt/yr of ore to produce about 465,000 t/yr of concentrate (Ney and Smakowski, 2004, p. 132-133).

In 2005, Poland's production of copper (in ore) increased by about 4% compared with that of 2004. The recovery of copper in concentrate remained at the level of 2004. The estimated total output of primary and estimated secondary smelter copper registered an increase of about 1% in 2005. The total output of electrolytically refined copper (primary and secondary) increased by about 2% compared with that of 2004 (table 5).

Trade data for 2005 show Poland's net exports of unwrought refined copper and copper alloys to have increased by about 6.4% compared with that of 2004. In 2004 (the latest year for which data were available), Germany, France, China, and Italy (in order of value of imports) were the principal importers of copper from Poland (table 9; Główny Urząd Statystyczny, 2005, p. 557).

In late 2005, KGHM officials indicated that the company must develop new copper deposits given that the current deposits in Poland face depletion in 11 years. To ensure the availability of future supplies of copper ore and concentrate, KGHM reported looking at additional investments in the Democratic Republic of the Congo, Peru (Rio Blanco copper project), and the Philippines (Metals Insider, 2005, 2006; Mining Journal, 2005).

Gold.—In 2005, Poland's gold production continued to be based almost entirely on the country's copper mining operations. The gold content of the copper concentrates produced by KGHM was reported to be about 1 gram per metric ton; total reserves were determined to be about 50 t (Ney and Smakowski, 2004, p. 202). In 2005, KGHM's copper refineries continued to increase the output of byproduct gold. The gold was recovered at KGHM's 550-kilogram-per-year precious metals plant (Boliden, Klado method), which was a division within the Glogow smelter and refinery. The amount of gold recovered at Glogow has varied with changes in the proportion of ores produced at the three mines, each of which has a different average gold content. Poland's annual domestic consumption of gold in recent years was in the range of about 296 to 530 kilograms (table 5; Ney and Smakowski, 2004, p. 202).

Iron and Steel.—In 2005, the total output of pig iron and crude steel fell short of 2004 production levels by 27% and 21%, respectively (table 5). Poland depended on imported iron ores and concentrates, and on such alloying materials as manganese ore, and chromite to produce the ferroalloys that were needed by the steel industry. According to 2005 trade data, imports of iron ore and concentrate declined by almost 38% compared with those of 2004. Imports of such semimanufatures as flat-rolled and stainless steel products, however, increased by more than 25% (table 8).

In 2004, Polskie Huty Staly S.A., which comprised the Huta Cedler, the Huta Florian, the Huta Katowice, and the Huta Sendzimira steelworks, was renamed Ispat Polska Stal S.A.; Ispat Polska Stal was a subsidiary of the Mittal Group, which was the world's leading steel producer. In 2005, Ispat Polska Stal S.A. was renamed Mittal Steel Poland (Metal Bulletin, 2004). To modernize these assets, Mittal signed agreements that called for Voest Alpine Industrienlagebau AG of Austria to build a new rolling mill (Huta Senzimira) and SMS Demag of Germany to provide a continuous casting line (Huta Katowice)

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by yearend 2006. The total cost of these projects was valued at $462 million (Reuters, 2005).

Lead and Zinc.—Poland worked 3 of the 21 known lead-zinc deposits in the Silesia-Crakow area, which hosted about 41 Mt of ore of the country's total resource of about 180 Mt of lead and zinc ore. Lead and zinc also were recovered from copper ore mined by KGHM in the Lubin region. About 33% of total mined lead came from copper mining and processing. Despite the presence of sphalerite in KGHM's copper deposits, the low zinc content of the ore had made metal recovery uneconomical to implement (Ney and Smakowski, 2004, p. 264, 502). In 2005, total mine production of lead in ore increased by about 33% compared with that of 2004; zinc in concentrate, however, decreased by 16%. The total output of refined lead (primary and secondary) in 2005 decreased by about 7% compared with that of 2004. In 2004, the total volume of imports of refined lead increased by 3% (tables 8).

In 2005, total refined zinc production (smelter and electrolytic) increased by 18.3% compared with that of 2004.

Silver.—In 2005, Poland remained among the major world producers of silver and accounted for more than 6% of world mine production (Brooks, 2007, p. 149). Copper and, to a lesser extent, lead and zinc mining were Poland's domestic sources of primary silver, which was associated with these ores. The country's copper mining, smelting and refining complex, which was operated by KGHM in the Lubin area, produced about 98% of the country's byproduct silver. In 2005, exports of silver fell sharply by 53%. The top three importers of Polish silver in 2004 were (in descending order of value) the United Kingdom, Germany, and Belgium (Główny Urząd Statystyczny, 2005, p. 182, 532).

Industrial Minerals

Poland produced a broad range of industrial minerals that included calcareous and silicate rocks and aggregates, clays, feldspar, gypsum, magnesite, salt, and sulfur, which served the needs of the country's chemical and construction industries. Poland remained among the leading world producers of lime, nitrogen (in ammonia), salt, and sulfur (Kostick, 2007; Kramer, 2007; Miller, 2007; Ober, 2007).

Mineral Fuels

Coal.—In 2005, bituminous coal production declined by more than 3% compared with that of 2004. In 2005, the country's net exports of bituminous coal and anthracite were about 1.7% less than in 2004. Germany, Austria, Slovakia, and Finland were (in order of value) the major importers of Polish coal (table 9; Główny Urząd Statystyczny, 2005, p. 219).

The Upper Silesian, the Lower Silesian, and the Lublin Basins have exploitable resources that amounted to 43,321 Mt of coal in 132 deposits. The Upper Silesian Basin represented the major portion of the country's total reserves, hosting about 79% of the total in 110 deposits (Ney and Smakowski, 2004, p. 224).

Natural Gas and Petroleum.—Poland depended on imports to meet its needs for oil and gas. In 2005, Poland's imports of petroleum increased by almost 2% compared with those of 2004 (table 8). The Russian Federation remained Poland's chief supplier of hydrocarbons which, in 2004 (in terms of value), supplied about 95% and 60%, respectively, of Poland's imports of petroleum and natural gas (Główny Urząd Statystyczny, 2005, p. 221, 223).

Outlook

Poland is expected remain an important world supplier of copper, salt, and sulfur and a major supplier coal, lead, and zinc to the European market. The country, however, will continue to rely on imports of natural gas and petroleum and iron ore and concentrate. As domestic sources of nonferrous metals become exhausted (2015 and beyond), Poland will increasingly depend on imports of commodities.

References Cited

Brooks, W.E., 2007, Silver: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 149.

Edelstein, D.L., 2007, Copper: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 52-53.

Główny Urząd Statystyczny, 2005, Rocznik Statystyczny Handlu Zagranicznego (Statistical yearbook of Poland's foreign trade): Glowny Urząd Statystyczny, September, 676 p.

Główny Urząd Statystyczny, 2006a, Maly rocznik statystyczny Polski (Concise handbook of Poland's statistics): Warsaw, Poland, Główny Urząd Statystyczny, June, 686 p.

Główny Urząd Statystyczny, 2006b, Rocznik statystyczny Pprzemyslu (Concise handbook of Poland's statistics): Warsaw, Poland, Główny Urząd Statystyczny, December, 522 p.

Kostick, D.S., 2007, Salt: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 136-137.

Kramer, D.A., 2007, Nitrogen (Fixed)—Ammonia: U.S. Geological Survey, Mineral Commodity Summaries 2007, p. 114-115.

Metal Bulletin, 2004, LNM gets green light from Polish competition watchdog: Metal Bulletin, no. 8831, March 1, p. 21.

Metals Insider, 2005, Poland's KGHM said studying copper mine investments in Peru: London, United Kingdom, Metals Insider, December 16, p. 9.

Metals Insider, 2006, KGHM warns of depleting local deposits: London, United Kingdom, Metals Insider, January 3, p. 13.

Miller, M.M., 2007, Lime: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 94-95.

Mining Journal, 2005, KGHM eyes Rio Blanco: London, United Kingdom, Mining Communications Ltd., April 15, p. 1.

Ney, Roman, and Smakowski, Tadeusz, eds., 2004, Bilans Gospodarki Surowcami W Polce Na Tle Gospodarke Swiatowoj 1998-2003 (Minerals yearbook of Poland): Krakow, Poland, Polish Academy of Sciences, Ministry of Environmental Protection, Natural Resources and Forestry, December, 515 p.

Ober, J.A., 2007, Sulfur: U.S. Geological Survey Mineral Commodity Summaries 2007, p. 160-161.

Reuters, 2005, Mittal signs $462 deals to revamp Polish plants: London, United Kingdom, Reuters press release, July 19, 2 p.

Internet Reference Cited

International Monetary Fund, 2006 (September), Poland, World Economic Outlook Database, accessed September 1, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/dbgim.cfm.

SLOVAKIA

Slovakia was a modest regional producer of a variety of minerals. Aluminum and steel production formed the dominant elements of the country's metals sector. Steel production largely

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was based on imported raw materials, and that of aluminum was based entirely on imported bauxite. Small quantities of copper, gold, lead, and zinc also were produced; the commercial deposits of these minerals have been virtually depleted. Industrial minerals production included that of barite, clays, magnesite, and salt. Slovakia's production of mineral fuels comprised brown coal and lignite and minor quantities of gas and petroleum (table 10).

The economy of Slovakia continued to develop towards a full market system. The need to denationalize the state's commercial assets and to reduce subsidies to the public sector expeditiously was tempered by policies promulgated to maintain social stability that often resulted in increased public sector employment and uneven economic performance. In 2005, Slovakia's real GDP increased by 6.1%. The per capita GDP based on purchasing power parity amounted to $16,041. The total value of industrial production in 2005 continued to show recovery with a growth rate of 3.9% compared with that of 2004; the value of nonenergy-related mining and quarrying grew by 11.4%. Nonenergy-related mining and quarrying, however, declined by about 10% (International Monetary Fund, 2006§).

In 2005, Slovalco A.S., which was Slovakia's sole producer of primary aluminum, increased the output of alumina by about 3.6%; the production of primary aluminum fell short of output in 2004 by about 9% (table 10). About 16% of total sales of aluminum metal was consumed domestically; the balance was exported. Italy and Poland were the major importers of Slovakia's aluminum. The company reported the completion of modernization in the casthouse (Slovalco A.S., 2006). Activities in the aluminum sector in 2005 included plans announced by Alcan Inc. of Canada to invest $35 million to build a new aluminum extrusion plant in Slovakia that would produce products for the construction sector. At yearend 2005, Sapa AB of Sweden conducted negotiations to buy Slovak aluminum semimanufactures producer Alufinal. The proposed deal would amount to $42.3 million (Associated Press, 2005; Metals Insider, 2006).

Exploration for gold and resource assessment at the Kremnica gold exploration area continued during 2005 under the auspices of the Tournigan Gold Corporation of Canada (Tournigan Gold Corporation, 2005, p. 6).

In 2005, the country's steel output at U.S. Steel Kosice s.r.o. declined by about 7% compared with that of 2004. Pig iron production declined by almost 3% (table 10).

In the mineral fuels sector, brown coal production declined by about 15% in 2005 compared with that of 2004. Russia remained Slovakia's chief supplier of natural gas and petroleum and accounted for more than 98% of the country's imports of these fuels.

Outlook

Slovakia is expected to continue to produce modest amounts of industrial minerals and mineral fuels. With the possible exception of gold, metal mining has practically ceased owing to depletion of economic reserves. Aluminum and ferrous metals will continue to be produced from imported ores and concentrates. The country will remain dependent in imports of energy carriers and metals for its industrial needs.

References Cited

Associated Press, 2005, Alcan to invest $35M in Slovakia plant: New York City, New York, Associated Press, September 28, 2 p.

Metals Insider, 2006, Sweden's Sapa closes buy of Slovak profiles manufacturer: London, United Kingdom, Metals Insider, January 5, p. 5.

Slovalco A.S., 2006, Annual report 2005: Ziar nad Hronom, Slovakia, Slovalco A.S., 68 p.

Tournigan Gold Corporation, 2005, Annual report, 2005: Vancouver, British Columbia, Canada, Tournigan Gold Corporation, December 9, p. 44.

Internet Reference Cited

International Monetary Fund, 2006 (September), Slovakia, World Economic Outlook Database, accessed September 1, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/dbgim.cfm.

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TABLE 1
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum, metal, secondary[e]		20,000	20,000	20,000	15,000	15,000
Copper, refined, secondary[e]		13,000 [r]	13,000 [r]	12,000 [r]	15,000 [r]	14,000
Gold, metal[e]	kilograms	2,000 [3]	2,000	1,000	1,000	1,000
Iron and steel:						
Iron ore:						
Gross weight	thousand metric tons	20	--	--	--	--
Fe content[e]		6,000	--	--	--	--
Metal:						
Pig iron	thousand metric tons	6,316	4,840	5,200	5,385	4,600
Ferroalloys, total electric furnace[e]	do.	1	1	--	--	--
Steel, crude	do.	6,316	6,512	6,800	7,033	6,200
Semimanufactures[e]	do.	12,645 [3]	12,500	12,500	12,500	12,500
Lead metal, secondary[e]		25,000	25,000	26,000	25,000	25,000
Silver[e]		25	25	25	25	25
Uranium:						
Mine output, U content		490	477	458	435	435
Concentrate production, U content		456	465	452	412	409
Zinc, metal, secondary[e]		250	250	250	250	250
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	3,550	3,217	3,465	3,709	3,978
Clays:						
Bentonite	do.	224	174	199	201	201
Kaolin	do.	5,543	3,650	4,155	3,862	3,882
Other	do.	585	564	554 [r]	649 [r]	671
Diamond, synthetic[e]	carats	5,000	5,000	5,000	5,000	5,000
Diatomite		83,000	28,000	41,000 [r]	33,000	38,000
Dolomite		364,000	314,000	416,000	345,000	419,000
Feldspar		373,000	401,000	421,000	488,000	472,000
Fertilizer materials:						
Nitrogenous, N content		250,000 [e]	250,000 [e]	251,000	271,000	270,000
Phosphatic, P_2O_5 content[e]		100,000	100,000	100,000	100,000	100,000
Potassic, K_2O content[e]		20,000	20,000	20,000	20,000	20,000
Mixed		75,000 [e]	75,000 [e]	36,000	30,000	30,000
Gemstones, crude, pyrope-bearing rock		47,000	52,000	53,000	42,000 [r]	43,000
Graphite		17,000	16,000	9,000	5,000	3,000
Gypsum and anhydrite, crude		24,000	108,000	104,000	71,000	70,000
Lime, hydrated and quicklime	thousand metric tons	1,300	1,120	1,251	1,264	1,223
Nitrogen, N content of ammonia[e]		206,000	215,000	235,000	250,000	250,000
Sand and gravel:						
Common sand and gravel	thousand metric tons	12,100	12,400	13,401	13,653	15,673
Foundry sand		771	476	714	831	807
Glass sand		974	853	904	829	920
Stone:						
Basalt, for casting		15,000 [e]	14,000	13,000	12,000	12,000 [e]
Dimension stone	thousand cubic meters	300,000	285,000	244,000	273,000 [r]	288,000
Limestone and other calcareous stones	thousand metric tons	10,887	10,186	10,236	10,568	9,912
Building stone	thousand cubic meters	10,500	10,600	12,459	13,177	13,000
Sulfur, byproduct, all sources[e]		40,000	40,000	45,000	45,000	45,000
Sulfuric acid		220,200	240,524	239,000	234,000	230,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	14,808	14,097	13,382	14,648	12,728
Brown and lignite	do.	51,643	49,335	50,390	48,290	49,125
Coke	do.	3,519	3,536	3,556	3,538	3,500

See footnotes at end of table.

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TABLE 1--Continued
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
MINERAL FUELS AND RELATED MATERIALS--Continued						
Fuel briquets from brown coal	thousand metric tons	280	302	314	300	300
Gas:						
Manufactured, all types[e]	million cubic meters	800	800	800	800	800
Natural, marketed[4]	do.	101	91	131	175	356
Petroleum:						
Crude:						
As reported	thousand metric tons	178	253	310	299	306
Converted	thousand 42-gallon barrels	1,100 [e]	1,620 [e]	1,984	1,880 [e]	1,920
Refinery products[e]	do.	35,000	35,000	35,000	35,000	35,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, arsenic, dolomite, illite, sodium compounds, talc, and zeolite are produced, but available information is inadequate make reliable estimates of output.

[3]Reported figure.

[4]Includes gas produced from coal mines. Gross output of natural gas is not reported but is believed to exceed reported marketed output by an inconsequential amount.

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TABLE 2
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities[1]	Annual capacity
Aluminum, secondary	Alcan Decin Extrusions s.r.o.	Decin, northern Bohemia	40,000
	Kovohute Mnisek a.s.	Mnisek	70,000
Bentonite	Keramost a.s.	Most	250
Cement	Ceskomoravsky Cement a.s.	Kraluv dvur	350
Do.	Heidelberger Cement, 82.8%	Mokra	1,400
Do.	do.	Radotin	750
Do.	Cizkovicka Cementarna a.s. (Lafarge, 85%)	Cizkovicka	980
Do.	Holcim (Cesko) a.s.	Prague	1,000
Do.	Cement Hranice a.s. (Dyckerhoff, 98%)	Hranice	850
Do.	Cemos Ostrava a.s. (Cement Hranice, 95%)	Ostrava	400
Clay	Ceske Lupkove Zavody a.s.	Nove Straseci (refactory clay)	120
Do.	Chlumcanske Keranicke Zavody a.s.	Chlumcany (kaolin)	30
Do.	Kaolin Hlubany a.s. (WBB Minerals, 94%)	Podborany	100
Coal:			
Bituminous	OKD a.s. Ostrava	Ostrava-Karvina, north Moravia	20,000
Brown	Severoceske Doly a.s.	Chomutov	14,000
Do.	Mostecka Uhelna Spolecnost a.s.	Most	17,000
Do.	Sokolovska Uhelna a.s.	Sokolov	30,000
Lignite	Lignit Hodonin s.r.o.	Hodonin, south Moravia	1,000
Gold	Kovohute Pribram Nastupickna a.s.	Pribram	9
Graphite	Grafitove doly Stare Mesto s.r.o.	Stare Mesto	10
Lead, metal, secondary, refined	Kovohute Pribram Nastupickna a.s.	Pribram	29
Natural gas million cubic meters	Gasfields in Brno and Ostrava regions:	Eastern/southeastern Czech Republic	500 [2]
	Ceska Naftarska Spol s.r.o.	Hodonin	
	Moravske Naftove Doly a.s.	do.	
	OKD Dulni Pruzkum a Bezpecnost a.s.	Paskov	
	UNIGEO a.s.	Ostrava-Hrabova	
Petroleum:			
Crude	Oilfields around Hodonin:		160 [2]
	Moravske Naftove Doly a.s.	Hodonin	
	Ceska Naftarska Spol s.r.o.	do.	
	UNIMASTER s.r.o	do.	
Refinery thousand 42-gallon barrels per day	Kolin, Kralupy, Pardubice, and Litvinov	Bohemia	200
Steel, crude	Nova Hut s.p. (Ostrava)	Kunice-Ostrava	3,800
Do.	Zelezarne Vitkovice	Vitkovice-Ostrava	900
Do.	Trinecke Zelezarny (Trinecke Iron and Steel Works)	Trinec	3,000
Do.	Poldi United Steel Works	Kladno-Prague	1,700
Do.	Zelezarny Bila Cerkev	Hradek-Rokycany	300
Do.	Zelezarny Veseli, a.s.	Veseli and Moravou	300
Do.	Zelezarny Chomutov s.p.	Chomutov	350
Do.	Bohumin Iron and Steel Works	Bohumin	400
Titanium dioxide	Precheza A.S	Precheza	25
Uranium	DIAMO s.p.	Straz pod Ralskem	2

[1]Names and locations of mines and crude oil refineries are identical.
[2]Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.

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TABLE 3
HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003[e]	2004	2005
METALS						
Aluminum:						
Bauxite, gross weight	thousand metric tons	1,000	720	666 [3]	647	535
Alumina, gross weight, calcined basis	do.	300	220 [e]	300	300	270
Metal:						
Primary		34,000	35,000 [e]	34,000	34,400	31,000
Secondary		76,000	75,000 [e]	50,000	50,000 [e]	50,000 [e]
Total		110,000	110,000 [e]	84,000	84,400	81,000
Copper, metal, refined including secondary[e]		12,000	10,000	10,000	10,000	10,000
Gallium		5,600 [e]	5,400	5,500 [3]	5,500	5,500
Iron and steel, metal:						
Pig iron	thousand metric tons	1,225	1,334	1,333 [3]	1,350	1,329
Ferroalloys[e, 4]		8,000	1,900	8,000	8,000	8,000
Steel:						
Crude	thousand metric tons	2,056	2,141	1,983 [3]	1,957	1,962
Semimanufactures, rolled only[e]	do.	1,900	1,900	1,803 [3]	1,844 [r]	1,850
Manganese ore:						
Run-of-mine:						
Gross weight		38,000	49,000 [e]	48,000 [3]	49,000 [r]	50,000
Mn content[e]		10,000	12,700	12,500	13,200 [r]	13,500
Concentrate:[e]						
Gross weight		15,000	15,000	15,000	15,000	15,000
Mn content		5,000	5,000	5,000	5,000	5,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	3,452	3,510	3,573 [3]	3,580	3,349
Clays:						
Bentonite:						
Raw		5,200	3,700	87,029 [3]	9,280 [r]	9,000
Processed[e]		2,500	1,400	42,000	3,700 [r, 3]	3,700 [3]
Kaolin, raw and washed		8,000	4,300	13,250 [3]	7,530 [r]	7,000
Gypsum and anhydrite[e]		252,000	72,200	62,000	55,000 [r, 3]	55,000 [3]
Lime, calcined[e]	thousand metric tons	500	500	500	500	500
Nitrogen, N content of ammonia[e]	do.	224	238	232 [3]	274 [3]	275
Perlite		151,000	140,000	59,530 [3]	65,100 [r]	65,000
Sand and gravel:						
Gravel	thousand metric tons	10,645	29,138	35,000	33,544 [r]	33,500
Sand:						
Common[e]	thousand cubic meters	300	300	300	300	300
Foundry		168,000	152,000	162,600 [3]	138,200 [r]	138,000
Glass		339,000	317,000	225,300 [3]	163,900 [r]	164,000
Stone:						
Dimension, all types[e]	thousand metric tons	5,000	5,626 [3]	5,500	5,000	5,000
Dolomite	do.	800	4,196	4,398 [3]	7,200 [r]	7,200
Limestone	do.	700	7,152	2,459 [3]	3,014 [r]	3,014
Sulfur, byproduct, elemental, all sources[e]		43,000	52,000	51,000	50,000	50,000
Sulfuric acid[e]		80,000	80,000	80,000	80,000	80,000
Talc[e]		500	500	-- [r]	-- [r]	--
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	573	660	667 [3]	260 [r]	--
Brown	do.	5,384	4,570	4,128 [3]	2,495 [r]	1,426
Lignite	do.	8,043	7,574	8,564 [3]	8,470 [r]	8,154
Total	do.	14,000	12,804	13,359 [3]	11,225 [r]	9,580
Coke, metallurgical[e]		650	650	650	650	650
Gas, natural, marketed	thousand cubic meters	3,280	3,353	3,010 [3]	3,200 [r]	3,159
Peat, agricultural use[e]		50	150	200 [3]	200	200

See footnotes at end of table.

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TABLE 3--Continued
HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003[e]	2004	2005
MINERAL FUELS AND RELATED MATERIALS--Continued						
Petroleum:						
Crude:						
As reported	thousand metric tons	1,064	1,050	1,133 [3]	1,100	948
Converted	thousand 42-gallon barrels	8,118	8,011	8,640	8,400 [e]	7,200
Refinery products[e, 5]	do.	40,000	40,000	40,000	40,000	40,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised.
[1]Table includes data available through November 2006.
[2]In addition to the commodities listed, diatomite and a variety of industrial minerals and construction materials, such as common clay, are also produced, but available information is inadequate to make reliable estimates of output.
[3]Reported figure.
[4]Hungary is believed to produce some blast ferromanganese.
[5]Excludes refinery fuel and losses.

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TABLE 4
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Alumina		Magyar Aluminium Ltd. (MAL)	Ajka Timfoldgyar plant, about 120 kilometers southwest of Budapest, near Lake Balaton	400
Do.		do.	Almasfuzito Timfoldgyar plant near the Czech Republic border, 63 kilometers northwest of Budapest	240
Do.		do.	Moson-Magyarovar plant, in northwestern corner of Hungary, about 12 kilometers from Austrian and Czechoslovak borders	30
Aluminum, primary		do.	Inota plant, near Varpalota, 75 kilometers southwest of Budapest	46
Bauxite		Magyar Aluminium Ltd. (MAL) (owns and operates Bakony Bauxite Mines Ltd.)	Bakony District, extending roughly 100 kilometers northeast along Lake Balaton	1,500
Cement		Belpafatvalvi Cement es Meszipari Rt [Heidelberger & Schwenk (Germany) and Hungarian Group]	Belapatfalva, near Miskolc, 125 kilometers northeast of Budapest	1,100
Do.		Beremend Cement es Meszipari Rt [Heidelberger & Schwenk (Germany), 100%]	Beremend, 45 kilometers south of Pecs	1,090
Do.		Dunai Cement es Meszmu Kft [Heidelberger & Schwenk (Germany), 100%]	Vac, 50 kilometers north of Budapest	1,200
Do.		Hejocsabai Cement es Meszipari Rt [Holderbank (Germany) and Hungarian Group]	Hejoscaba, 150 kilometers northeast of Budapest	1,450
Do.		Labatlani Cementipari kft [Holderbank (Germany), 100%]	Labatlan, 20 kilometers north of Tatabanya	550
Clays		Agyag-Asvany Kft [Navan Resources PLC (Ireland)]	Felsopeteny, one underground and two open pit mines and a 5,000-metric-ton-per-year processing plant. Products are ball clay, kaolin, and refractory clay	35
Coal:				
Bituminous and lignite		Magyar Szenbanyaszati Troszt (MSZT) (Hungarian Coal Mining Trust)	Tatabanya and Oroszlany coal mining region, 45 kilometers west of Budapest	8,900
Do.		do.	Mecsek coal mining region, near Pecs and Komlo, north of the Yugoslav border	3,100
Do.		do.	Borsod coal mining region, 130 kilometers northeast of Budapest	5,200
Lignite		do.	Thorez opencast mine at Visonta, 80 kilometers northeast of Budapest	7,000
Manganese		Orszagos Erc-es Asvanybanyak (National Ore and Mineral Mines)	Urkut manganese ore mines, 120 kilometers southwest of Budapest	160
Natural gas	million cubic feet	Hungarian Oil and Gas Co. (MOL)	Szeged and Algyo gasfields, southern Hungary	152,000
Do.		do.	Hajduszoboszo gasfields, 180 kilometers east of Budapest	50,000
Do.		do.	Smaller gasfields are Szank, Kardoskut, Bekes, Berefurdo, and others	39,000
Perlite		Perlit 92 Kft [Navan Resources PLC (Ireland) and Hungarian Group	Palhaza, northeastern Hungary; open pit mine and processing plant	150
Petroleum:				
Crude	million 42-gallon barrels	Hungarian Oil and Gas Co. (MOL)	Szeged-Algyo Field, near Romanian-Yugoslav border; 50% of total capacity	7
Refined		Subsidiaries of Hungarian Oil and Gas Co. (MOL):		
Do.	do.	Danube Petroleum Refining Co.	Szazhalombatta	55
Do.	do.	Tisza Petroleum Refining Co.	Leninavaros	22
Do.	do.	Zala Petroleum Refining Co.	Zalaegerszeg	4
Silica		Uveg-Asvany Kft. [Navan Resources PLC (Ireland) and Hungarian Group]	Mine and plant at Fehevaresugo	660
Steel		Dunaferr Dunai Vasmu Rt	60 kilometers south of Budapest	1,400
Do.		OAM-Ozdi Acelmuvek Kft	120 kilometers northeast of Budapest	360
Do.		DAM-Diosgyori Acelmuvek es Kereskedelmi Kft	Diosgyoer, 145 kilometers northeast of Budapest	850

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TABLE 5
POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum, metal:						
Primary	metric tons	44,723	49,125	45,371	45,807	42,717
Secondary	do.	9,900	9,700	11,900 r, e	12,000 r, e	12,000 e
Total	do.	54,623	58,825	57,300 r, e	57,800 r, e	54,700 e
Cadmium, metal, primary	do.	330	440	375	356	408
Copper:						
Ore:						
Gross weight		30,227	29,705	29,992	31,800	32,019
Cu content	metric tons	545,000	568,000	570,000 e	590,000	614,800
Concentrate:						
Gross weight		1,834	1,935	1,900 e	1,950	1,950
Cu content	metric tons	532,000	503,000	495,000	526,000	526,000
Metal:						
Smelter:						
Primary	do.	485,900 r	510,700	515,000 e	541,000	552,200
Secondary[e]	do.	27,900	29,400	28,500 e	30,000	25,000
Total	do.	513,800 r	540,100	543,500	571,000	577,200
Refined, electrolytically, primary and secondary	do.	498,451	508,674	529,616	550,066	560,256
Gold, mine output, Au content	kilograms	349	296	356 r	527	530
Iron and steel:						
Pig iron:						
For foundry use		98	52	132 e	200 e	200 e
For steel production		5,343	5,245	5,500 e	6,200	4,477
Total		5,441	5,297	5,632	6,400	4,677
Ferroalloys:						
Blast furnace, ferromanganese	metric tons	500	600	1,000 e	1,000 r, e	1,000 e
Electric furnace:						
Ferrochromium	do.	--	100	200	100	100 e
Ferrosilicomanganese	do.	20,000	7,500	-- r	8,000 e	8,000 e
Ferrosilicon	do.	48,600	41,800	92,700 r, e	110,000 r, e	80,000
Total	do.	69,100	50,000 r	93,900 r, e	119,100 r	89,100
Steel, crude:						
From open hearth furnaces		178	169	--	--	--
From oxygen converters		5,822	5,531	6,070	6,865	4,927
From electric furnaces		2,809	2,667	3,040	3,713	3,409
Total		8,809	8,367	9,110	10,578	8,336
Semimanufactures:						
Hot rolled		6,599	6,114	6,595	6,600	6,188
Cold rolled		1,350	1,349	1,533	1,600	1,600
Pipe		440	309	309	310	380
Lead:						
Pb-Zn ore, gross weight	metric tons	-- r	-- r	-- r	-- r	--
Mine output:						
Pb content of Pb-Zn ore	do.	69,600	73,500	74,000 r	51,000	78,000
Pb content of Cu ore	do.	52,000	46,900	36,000 r	36,000	37,800
Total	do.	121,600	120,400	110,000 r	87,000	115,800
Concentrate:						
Gross weight	do.	86,400	85,000	100,200 r	110,200 r	110,000 e
Pb content	do.	52,600	56,600	54,700 r	60,200 r	60,000 e
Metal:						
Smelter:[e]						
Primary	do.	30,800 6	29,400 6	25,000	25,000	20,000
Secondary	do.	39,500 6	44,700 6	45,000	45,000	45,000
Total	do.	70,300 6	74,100 6	70,000	70,000	65,000
Refined, primary and secondary	do.	66,000	65,800	55,563	55,932 r	52,059

See footnotes at end of table.

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TABLE 5--Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS--Continued						
Platinum-group metals, average content of slimes:[e, 3, 4]						
Palladium	kilograms	12	12	10 e	10	10
Platinum	do.	20	20	20 e	20	20
Selenium	metric tons	65	68	78 r	83	83
Silver, mine output, Ag content	do.	1,190	1,222	1,237	1,344	1,344
Zinc:						
Zn content:						
Mine output	do.	172,300	171,200	174,700	170,000 r, e	150,000
Concentrate output	do.	152,700	152,200	153,900	140,300 r	117,200
Metal, refined, including secondary	do.	174,700	158,900	154,200	131,000 r	155,000
INDUSTRIAL MINERALS						
Barite, beneficiated	do.	2,500	2,700	3,030	3,183	2,357
Cement:						
Clinker		9,335	8,812	8,525	9,600 r, e	9,600 e
Hydraulic		12,074	10,948	11,653	12,837	12,646
Portland		11,115	10,000	10,700	11,700 r, e	11,700 e
Clays and clay products, crude:						
Bentonite	metric tons	29,000	26,200	31,648	66,143	86,331
Fuller's earth	do.	29,000	26,200	27,000 e	28,000 e	28,000 e
Fire clay		140	128	144	137	156
Kaolin:						
Crude		267	252	170	191	214
Beneficiated		129	114	136	191	115
Diatomite	metric tons	1,000	1,000	700	1,000 e	1,000 e
Feldspar:						
Run of mine	do.	150,000 r	219,000 r	256,000 r, e	250,000 r, e	250,000 e
Processed, including imported material	do.	200,600	293,000	341,400 r	320,000	320,000
Gypsum and anhydrite:						
Natural:[5]						
Gypsum rock		999	867	1,031	971 r	1,000
Anhydrite		285	280	297	201 r	243
Total		1,284	1,147	1,328	1,172 r	1,243
Synthetic gypsum		1,134	1,134 r	1,094 r	1,000 e	1,000 e
Grand total		2,418	2,281 r	2,422 r	2,172 r	2,243
Lime, hydrated and quicklime		1,954	1,865	1,955	2,086 r	1,688
Magnesite:[e]						
Ore, crude	metric tons	23,000 6	24,000 6	24,000	24,000	24,000
Concentrate	do.	22,200 6	22,100 6	22,100	22,100	22,100
Calcined	do.	200 6	100 6	100	100	100
Nitrogen, N content of ammonia		1,169	1,362	1,912	1,985	1,985
Salt:						
Rock		787	839	848	1,099	1,123
Other		2,689	2,719	3,812	4,043	3,762
Total		3,476	3,558	4,660	5,142	4,885
Sand, excluding glass sand:						
Aggregates:						
Mine output	metric tons	73,107	66,722	78,945 r	75,000 r	75,000 e
Processed	do.	62,534	62,799	71,376 r	65,000 r	65,000 e
Foundry sand		849	628	666 r	650	650 e
Filling sand		8,914	9,122	8,612 r	9,000	9,000 e
Lime-sand brick production sand	thousand cubic meters	492	411	483 r	450	450 e
Silica:						
Glass:[e]						
Construction, flat		394 6	400	400	400	400
Technical		54 6	60	60	60	60

See footnotes at end of table.

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TABLE 5--Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Silica--Continued:						
Glass--Continued:[e]						
Commercial		81 [6]	80	80	80	80
Packing		993 [6]	900	900	900	900
Processed:						
Glass sand		1,423	1,235	1,402	1,500 [e]	1,500 [e]
Quartz and quartz crystal	metric tons	65,900	27,000	33,000 [e]	35,000 [e]	35,000 [e]
Quartzite, refractory	do.	114,200	32,000	115,400	50,000 [e]	50,000 [e]
Quartz schist	do.	5,500	3,000	2,800 [e]	3,000 [e]	3,000 [e]
Sodium compounds, n.e.s.:						
Carbonate (soda ash), 98%		1,062	1,054	1,050	1,167	1,189
Caustic soda (96% NaOH)		348	395	427	452	475
Stone:						
Mine output:						
Crushed and dimension stone		22,466	22,619	21,105 [r]	23,000 [e]	23,000 [e]
Dolomite		1,639	1,585	1,815	1,986	1,834
Limestone:						
For lime production		11,324	10,306	11,379 [r]	11,000 [r]	10,000 [e]
For non-lime end use		24,289	23,233	23,747	25,463	24,607
Sulfur:						
Native, Frasch		942	760	762	821	802
Byproduct:						
From metallurgy		277	275	275 [e]	275 [e]	275 [e]
From petroleum		162	180	175 [e]	175 [e]	175 [e]
Total		439	455	450 [e]	450 [e]	450 [e]
From gypsum[e]		10	10	10	10	10 [e]
Grand total		1,391	1,225	1,222	1,281	1,262
MINERAL FUELS AND RELATED MATERIALS						
Carbon black		15,100	16,900	18,500 [r]	15,000	15,000
Coal:						
Bituminous		103,992	103,546	103,016	101,230	97,903
Lignite and brown		59,557	58,210	60,919	61,197	61,136
Total		163,549	161,756	163,935	162,427	159,039
Coke, coke oven		8,844	8,787	10,111	7,752	5,610
Fuel briquets, all grades		50	50 [e]	4	3	3
Gas:						
Natural	million cubic meters	5,175	5,259	5,315	5,630 [r]	5,742
Manufactured:						
Town gas	do.	6	6 [e]	4	5	5
Coke oven gas	do.	3,919	3,752	4,245	4,216	4,200
Generator gas[e]	do.	300	300	300	300	300
Total	do.	4,225	4,058	4,549	4,521	4,500 [e]
Peat, fuel and agricultural		325	300 [e]	430	509	500
Petroleum:						
Crude, as reported		767	721	765	886	849
Refinery products[6]		18,680	17,540	16,886	17,000 [e]	16,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, antimony and germanium, which are associated with polymetallic deposits, and cobalt and nickel, which are associated with copper ores, are produced in quantities that so far have not warranted further recovery.

[3]Based on official Polish estimates.

[4]Estimates based on reported platinum- and palladium-bearing final (residual) slimes and their average Pt and Pd content from electrolytic copper refining.

[5]Includes building gypsum, as well as an estimate for gypsum used in the production of cement.

[6]Reported figure.

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TABLE 6
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Aluminum:			
Primary	Huta Aluminium "Konin" S.A.	Konin	55.
Secondary	Zaklady Metalurgiczne "Skawina"	Skawina	20.
Do.	Zaklady Metali Lekkich SA "Kety"	Kety	NA.
Do.	Zaklady Metalurgiezne "Trzebinia"	Trzebinia	NA.
Barite[2]	Przedsiebiorstvo Hondlowo Uslugowe R&S Spolka Jawna	Boguszow, Stanislawow	3.
Cement:			
Do.	Zaklady Cementowo-Wapiennicze Gorazdze S.A.	Chorula	1,800 clinker, 2,400 cement.
Do.	Cementownia "Ozarow" S.A.	Ozarow	2,200 clinker, 2,400 cement.
Do.	Cementownia "Chelm" S.A.	Chelm	1,440 clinker, 2,640 cement.
Do.	Kombinat Cementowo-Wapienniczy Warta S.A.	Dzialoszyn	600 clinker, 1,150 cement.
Do.	Cementownia "Malogoszcz" S.A.	Malogoszcz	1,840 clinker, 1,800 cement.
Do.	Zaklady Cementowo-Wapiennicze Nowiny S.A.	Sitkowka	785 clinker, 1,070 cement.
Do.	Cementownia "Strzelce Opolskie" S.A.	Strzelce Opolskie	1,257 clinker, 1,630 cement.
Do.	Kombinat Cementowo-Wapienniczy "Kujawy" S.A.	Bielawy	900 clinker, 1,000 cement.
Do.	Cementownia "Rudniki" S.A.	Rudniki	840 clinker, 1,470 cement.
Do.	Cementownia "Wierzbica" S.A.	Wierzbica	759 clinker, 1,000 cement.
Do.	Cementownia "Nowa Huta" S.A.	Krakow	290 clinker, 1,100 cement.
Do.	Cementownia "Rejowiec" S.A.	Rejowiec	600 clinker, 845 cement.
Do.	Cementownia "Odra" S.A.	Opole	433 clinker, 800 cement.
Do.	Cementownia "Warszawa"	Warszawa (Warsaw)	600 cement.
Do.	Cementownia "Groszowice" Sp. z.o.o.	Opole	304 clinker, 425 cement.
Do.	Cementownia "Polcement-Saturn"	Wojkowice	400 cement
Do.	Cementownia "Wiek"	Ogrodzieniec	710 clinker, 240 cement.
Do.	Fabrika Cementu "Wysoka"	Lazy	304 clinker, 425 cement.
Do.	Cementownia "Wejhorowie"	Wejhorowo	42 clinker, 45 cement.
Coal:			
Anthracite	Zaklad Wydobywczo Przetworczy Antracytu Walbrzych-Gaj	Lower Silesia	200.
Bituminous	Includes:	Of which:	140,000.[3]
	Bytomska Spolka Weglowa S.A.	Upper Silesia (9 mines)	
	Rudzka Spolka Weglowa S.A.	do. (6 mines)	
	Gliwicka Spolka Weglowa S.A.	do. (7 mines)	
	Katowicki Holding Weglowy S.A.	do. (11 mines)	
	Nadwislanska Spolka Weglowa S.A.	do. (8 mines)	
	Rybnicka Spolka Weglowa S.A.	do. (5 mines)	
	Jastrzebska Spolka Weglowa S.A.	do. (6 mines)	
	Seven independent mines	do.	
	Walbrzyskie Kopalnie Wegla Kamiennego	Lower Silesia	
	KWK "Nowa Ruda"	do.	
	KWK "Bogdanka" S. A.	do.	

See footnotes at end of table.

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TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Coal--Continued:			
Lignite	Includes:	Of which:	75,000.[3]
	KWK "Belchatow"	Belchatow	
	KWK "Turow"	Turow	
	KWK "Konin"	Konin	
	KWK "Adamow"	Adamow	
	KWK "Sieniawa"	Sieniawa	
Coke	Includes	Of which:	12,000.[3]
	Zaklady Koksownicze im. Powstancow Sl.	Upper Silesia	
	Zaklady Koksownicze "Przyjazn"	do.	
	Kombinat Koksochemiczny "Zabrze"	do.	
	Huta im. Sendzimira	do. (Krakow)	
	Huta "Czestochowa"	do. (Czestochowa)	
	Zaklady Koksownicze "Walbrzych"	Lower Silesia	
Copper:			
Ore, gross weight (1.2%-2.2% Cu)	Kombinat Gorniczo Hutniczy Miedzi (KGHM) Polska Miedz S.A. [KGHM, S.A.]	Lubin Mine, Lubin-Glogow District	7,000.
Do.	do.	Polkowice-Sieroszowice Mine, Lubin-Glogow District	9,200.
Do.	do.	Rudna Mine, Lubin-Glogow District	11,000.
Concentrate, gross weight (25.2% -25.9% Cu)	do.	Lubin beneficiation plant, Lubin-Glogow District	465.
Do.	do.	Polkowice beneficiation plant, Lubin-Glogow District	450.
Do.	do.	Rudna beneficiation plant, Lubin-Glogow District	700.
Metal, refined	do.	Refineries at Glogow I, Glogow II, and Legnica	480.
Feldspar	Strzeblowskie Kopalnie Surowcow Mineralnych	Mine at Sobotka, Lower Silesia, workings at Pagorki Zachodnie and Pagorki Wschodnie	50.
Ferroalloys:			
Electric furnace (FeSiMn, FeMn, FeCr, FeSi)	Huta "Laziska" S.A.	Upper Silesia at Laziska Gome	170.
Blast furnace (FeMn)	Huta "Pokoj" S.A.	Upper Silesia, Ruda Slaska	90.
Gold kilograms	KGHM "Polska Miedz" S.A.	Refinery at Glogow "Trzebinia"	550.
Gypsum and anhydrite	Includes:	Of which:	1,400.[3]
	Zaklady Przemyslu Gipsowego "Dolina Nidy"	Southeastern Poland, Gacki	
	Zaklad Gipsowy "Stawiany"	Southeastern Poland, Szarbkow	
	Kopalnia Anhydrytu "Nowy Lad"	Lower Silesia, Niwnice	
	KGHM "Polska Miedz" S.A.	Lower Silesia, Iwiny	
Helium million cubic meters	Zaklad Odazotowania Gazu	Western Poland, Odolanow	3.
Kaolin	KSM "Surmin-Kaolin" S.A.	Lower Silesia, Nowogrodziec	50.
Lead-zinc:			
Concentrate	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw"	Mines and concentrators at Olkusz and Pomorzany, Bukowno region	60 lead, 160 zinc.
Metal:			
Pb, refined	Huta Cynku "Miasteczko Slaskie"	Refinery at Miasteczko Slaskie	60.
Do.	Huta Metali Niezelaznych "Szopienice"	Katowice	35.
Zn, refined	Huta Cynku "Miasteczko Slaskie"	Imperial Smelter at Miasteczko Slaskie	60.
Do.	Zaklady Metalurgiczny "Silesia" (input from Huta "Miasteczko Slaskie"	Refinery at Katowice	30.
Do.	Zaklady Gorniczo-Hutnicze "Boleslaw"	Refinery at Boleslaw	65.
Do.	Huta Metali Niezelaznych "Szopienice"	Katowice	28.

See footnotes at end of table.

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TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Lime[3]		Zaklady Przemyslu Wapienniczego Trzuskawica	Kieleckie County, Swietokrzyskie Mountains	4,500.[3]
		Slaskie Zaklady Przemyslu Wapienniczego Opolwap S.A.	Opole County	
		Zaklady Przemyslu Wapienniczego Bukowa	Kieleckie County, Swietokrzyskie Mountains	
		Kombinat Cementowo-Wapienniczy Kujawy S.A.	Bydgoskie County	
		Zaklady Cementowo-Wapiennicze Gorazdze S.A.	Opole County	
		Zaklady Cementowo-Wapiennicze Nowiny	Kieleckie County	
		Produkcyjno-Handlowo-Uslugowe Wapmo-Sabinow	Czestochowa County	
		Wojcieszowskie Zaklady Przemyslu Wapienniczego Sp. z.o.o.	Jeleniogorskie County	
		Zaklady Przemyslu Wapienniczego w Sulejowie	Piotrkowskie County	
		Zaklad Wapienniczy w Plazie	Katowickie County	
Natural gas	million cubic meters	Ministry of Mining and Energy	Gasfields at pre-Carpathian foothills; Carpathian Mountains Lowlands, near Ostrow Wielkopolski, Poznan, and Trzebnica, north of Wroclaw	4,900.
Nitrogen:				
Ammonia (NH_3)		Includes:	Of which:	2,400.[3]
		Zaklady Azotowe "Pulawy" S.A.	Pulawy in eastern Poland	
		Zaklady Azotowe "Kedzierzyn" S.A.	Kedzierzyn in Upper Silesia	
		Zaklady Azotowe "Wloclawek" S.A.	Wloclawek in central Poland	
		Zaklady Azotowe S.A. w Tarnowie	Tarnow in southern Poland	
		Zaklady Azotowe S.A. w Chorzowie	Chorzow in Upper Silesia	
		Zaklady Chemiezne "Police"	Police in northwest Poland	
Fertilizer (N)		do.	do.	1,700.
Petroleum:				
Crude		Includes:	Of which:	200.[3]
		Polskie Gornictwo Naftowe i Gazownictwo Warszawa	Oilfields in northern and northwestern lowlands; sub-Carpathian region and Carpathian Mountains	
		Predsiebiorstwo Poszukiwan i	do.	
Do.		Eksploatacji Rpy i Gazu "Petrobaltic"	Baltic Sea Shelf	100.
Refined		Includes:	Of which:	13,500[3]
		Petrochimia-Plock	Plock in central Poland	
		Rafineria "Gdansk"	Gdansk in northern Poland	
		Rafineria "Chechowice"	Czechowice in southern Poland	
		Rafineria "Trzebinia"	Trzebinia in southern Poland	
		Rafineria "Glimar" Gorilice	Gorilice in southern Poland	
		Rafineria "Jedlicze"	Jedlicze in southern Poland	
		Podkarpackie Zaklady Rafyneryjne w Jasle	Jaslo in southern Poland	
Salt, all types		Includes:	Of which:	6,500.[3]
		Inowroclawskie Kopalnie Soli S.A.	Gora, Mogilno I, and Mogilno II Mines at Inowroclaw in central Poland	
		Kopalnia Soli "Klodawa"	Klodawa in central Poland	
		Kopalnia Soli "Wieliczka"	Wieliczka in southern Poland, near Krakow, mining deposits at Barycz and Wieliczka	
		Kopalnia Soli "Bochnia"	Southern Poland, mines at the Lezkowice and Siedlec-Moszczenica-Lapczyca deposit. Not known to have operated in 1999	
		KGHM "Polska Miedz" S.A.	Sieroszowice in southwestern Poland	
		Kopalnia Wegla Kamiennego "Debiensko"	Debiensko, Upper Silesia	
		Janikowskie Zaklady Sodowe "Janikosoda" S.A.	Janikowo in central Poland	

See footnotes at end of table.

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TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Selenium	Includes: Huta Metali Niezelaznych 'Szopienice" KGHM "Polska Miedz" S.A.	Of which: Katowice Refinery at Glogow	80.[3]
Silver	KGHM "Polska Miedz" S.A. and Zaklady Metalurgiczne Trzebinia	Refined from dore produced by the Szopienice Pn-Zn smelter-refinery largely from KGHM-supplied slimes	1.[3]
Steel:			
Crude and semimanufactures	Includes:	Of which:	14,000 (crude).[3]
	Huta Katowice S.A.	Plant at Dobrowa Gornicza, producing pig iron, crude steel, hot-rolled products, and cast steel	
	Huta im. T. Sendzimir S.A.	Steelworks at Krakow, producing pig iron, crude steel, hot-rolled products, cold-rolled products, pipes, and cast iron	
	P.P. Huta "Zawierciu"	Steelworks at Zawierciu, producing crude steel, hot-rolled products, cast iron, and cast steel	
	Huta Czestochowa S.A.	Steelworks at Czestochowa, producing pig iron, crude steel, hot-rolled sheets, pipes, and cast iron	
	Huta "Ostrowiec" S.A.	Steelworks at Ostrowiec-Swietokrzyski, producing crude steel, hot-rolled products	
	P.P. Huta "Labedy"	Steelworks at Gliwice, producing crude steel, and hot-rolled products	
	Huta "Lucchini-Warszawa" Sp. z o.o.	Steelworks in Warsaw, producing crude steel, hot-rolled products, and cold-rolled strip	
	Huta Florian S.A.	Steelworks in Swietochlowicach, producing crude steel, hot-rolled products, galvanized sheet, and cold-rolled strip	
	Huta "Stalowa Wola" S.A.	Steelworks at Stalowa Wola, producing crude steel	
	Huta "Jednosc" S.A	Steelworks at Siemianowice Slaskie, producing crude steel, hot-rolled products, and pipes	
	Huta "Batory" S.A.	Steelworks at Chorzow, producing crude steel, hot-rolled products, and pipes	
	P.P. Huta "Baildon"	Steelworks in Katowice, producing crude steel, hot-rolled products, cold-rolled strip, and cast steel	
	Huta "Malapanew" S.A.	Steelworks at Ozimek, producing crude steel and cast steel	
	Huta "Zabrze" S.A.	Steelworks at Zabrze, producing crude steel, cast iron, and cast steel	
	Huta "Zygmunt" S.A.	Steelworks at Bytom, producing crude steel, cast iron, and crude steel	
Semimanufactures only	Huta Cedler S.A.	Steelworks in Sosnowiec, producing hot-rolled products, cold-rolled strip, and cast iron	
	P.P. Huta "Kosciuszko"	Steelworks at Chorzow, producing hot-rolled products	
	Huta "Pokoj" S.A.	Steelworks at Ruda Slaska, producing hot-rolled products	
	Huta "Andrzej" S.A.	Steelworks at Zawadskie, producing pipes	
	Huta "Ferrum" S.A.	Steelworks in Katowice, producing pipes	
	P.P. Huta "Bobrek"	Steelworks in Bytom, producing pig iron, hot-rolled products, and cast iron	
	Huta "Buczek" S.A.	Steelworks in Sosnowiec, producing pipes and cast iron	
	P.P. Huta "1 Maja"	Steelworks in Gliwice, producing hot-rolled products	
	Zaklad Wielkopiecowy "Szczecin" Sp. z o.o.	Steelworks at Szczecin, producing pig iron	

See footnotes at end of table.

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TABLE 6--Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Sulfur	Includes:	Of which:	5,700.[3]
	P.P.Kopalne i Zaklady Przetworcze Siarki "Siarkopol"	Operations at Tarnobrzeg, mining the Jeziorko-Grebow-Wydza deposit	
	P.P. Kopalnie i Zaklady Chemiczne Siarki "Siarkopol"	Operations at Grzybow, mining the Osiek and Grzybow-Gacki deposits	

[1]The data presented in this table were compiled, in large measure, from information provided in the Minerals Yeabook of Poland (Bilans Gospodarki Surowcami Mineralnymi w Polsce Na Tle Gospodarki Swiatowej 1995-2003) prepared and published by the Department of Mineral and Energy Policy, Mineral and Energy Economy Research Centre of the Academy of Science of Poland, The Ministry of Environmental Protection, Natural Resources, and Forestry. Additionally, very valuable information and criticism was provided by Mr. Krystof Galos and other members of his academic department.
[2]The production of barite at the "Boguszow" Barite Mine was stopped in 1997 because of large-scale area flooding and its future status is uncertain.
[3]Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.
[4]In order of size.

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TABLE 7
POLAND: RESOURCES OF MAJOR MINERALS IN 2005

(Million metric tons of ore unless otherwise specified)

Commodity		Number of deposits		Geologically documented resources		
		Total	Exploited	Total	Exploited	Annual percentage change of total
METALS						
Copper		14	6	1,985	1,603	-2.3
Lead and zinc		21	3	171	32	-1.7
INDUSTRIAL MINERALS						
Raw materials for chemicals:						
Sulfur, native		18	5	525	38	12
Rock salt		19	5	80,165	11,178	--
Barite		5	--	6	--	--
Potassium-magnesium salts		5	1	669	72	--
Raw materials for construction:						
Chalk		196	55	198	20	--
Clay:						
Argillaceous material for construction ceramics		1,209	311	3,987	524	--
Bentonite		8	1	2.7	0.5	--
Ceramic		29	6	145	11	2.8
Refractory		17	3	57	5	-1.8
Kaolin		14	2	215	82.2	--
Dolomite		11	4	353	164	1.7
Feldspar ore		8	2	94	11.2	-1
Gypsum and anhydrite		15	4	261	115	-1
Magnesite		6	1	13.3	3	--
Sand and gravel:						
Filling sand		32	10	4,600	1,173	--
Moulding sand		78	12	350	116	-1
Quartz sand for brick and concrete		159	46	719	134	-1
Gravel aggregates		5,118	1,893	14,637	3,302	1.0
Silica:						
Glass sand		30	8	599	218	--
Quartz, veined		7	3	7	5	--
Quartzite, refractory		19	1	14	7	-3.4
Stone:						
Stone for construction and road use		567	236	8,230	3,927	--
Limestone and marl for lime and cement use		178	38	18,110	6,063	--
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		132	46	43,321	15,291	1.8
Lignite		76	10	13,724	1,878	1.0
Gas:						
Natural	billion cubic meters	260	180	151	121	-2
Coal methane	do.	48	20	86	22	1.2
Petroleum	do.	86	67	22	19	10

-- Zero.

Sources: Central Statistical Office of Poland, 2005, Statistical Yearbook of Industry; Polish Academy of Sciences, 2004, Minerals Yearbook of Poland; Concise Statistical Yearbook of Poland.

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TABLE 8
POLAND: IMPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum and articles thereof		310	374	354	520	551
Chromite		26	9	11	NA	NA
Cobalt, matte, oxide, and scrap	metric tons	86	71	88	NA	NA
Iron ore and concentrate		7,709	6,957	8,950	10,932	6,789
Lead:						
Concentrates, Pb content		4	5	2	--	--
Refined		12	33	32	33	34
Manganese, ore and concentrate		44	15	10	NA	NA
Steel:						
Flat-rolled, nonalloy semimanufactures		2,535	2,357	NA	2,862	3,602
Stainless and articles thereof		84	91	NA	144	163
Pipes and hollow profiles		289	344	NA	415	442
Zinc, metal refined		NA	8	12	17	13
INDUSTRIAL MINERALS						
Alumina		135	123	146	NA	NA
Barite		7	6	8	NA	NA
Bauxite		38	50	69	NA	NA
Bentonite		65	68	94	NA	NA
Cement:						
Clinker		251	67	70	NA	NA
Cement		347	654	719	NA	NA
Feldspar		144	168	155	NA	NA
Flourspar		5	6	5	NA	NA
Glass		466	549	534	707	759
Graphite, natural and synthetic		55	61	63	NA	NA
Gypsum and ahydrite		23	46	104	NA	NA
Kaolin, washed		61	70	72	NA	NA
Mineral fertilizers		1,426	1,609	1,875	1,999	1,648
MINERAL FUELS AND RELATED MATERIALS						
Coal, including briquets		1,903	2,768	2,560	2,335	3,372
Natural gas	million cubic meters	8,325	7,775	8,721	NA	NA
Petroleum:						
Crude		17,513	17,872	17,448	17,309	17,641
Refined		2,318	2,501	2,039	3,155	3,599

NA Not available. -- Zero.

Sources: Central Statistical Office of Poland, Yearbook of Foreign Trade, 2003 and 2005; Polish Academy of Sciences, Minerals Yearbook of Poland, 1999-2003.

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TABLE 9
POLAND: EXPORTS OF SELECTED MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum and articles thereof		230	264	319	332	385
Cadmium	metric tons	198	49	428	NA	NA
Cobalt, matte, oxide, and scrap	do.	14	1	--	NA	NA
Copper:						
Refined copper and copper alloys		233	288	277	282	300
Copper manufactures		143	123	121	177	163
Lead:						
Concentrates, Pb content		56	58	52	54	NA
Metal, refined		10	21	32	27	28
Silver and articles thereof	metric tons	1,094	1,135	1,254	683	319
Steel:						
Pig iron		41	3	16	NA	NA
Steel, crude		2	3	3	NA	NA
Flat-rolled, nonalloy semimanufactures		2,219	2,151	NA	2,694	2,148
Pipes and hollow profiles		202	35	NA	184	188
Zinc:						
Concentrate, Zn content		16	34	35	25	NA
Metal and articles thereof		92	89	80	82	82
INDUSTRIAL MINERALS						
Cement		897	478	264	769	602
Glass		682	662	697	803	872
Salt		376	343	423	NA	NA
Sulfur		774	600	534	NA	NA
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite and bituminous		23,032	22,626	20,128	19,700	19,371
Lignite		15	42	37	NA	NA
Coke and semicoke	thousand metric tons	3,924	4,226	5,267	5,258	4,524
Petroleum, refined		2,523	2,446	1,389	NA	NA

NA Not available. -- Zero.

Sources: Central Statistical Offiice of Poland, Yearbook of Foreign Trade, 2003 and 2005; Polish Academy of Sciences, Minerals Yearbook of Poland, 1999-2003.

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TABLE 10
SLOVAKIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Alumina	metric tons	110,078	111,618	132,089	156,893	162,483
Aluminum ingot, primary	do.	133,672	146,958	165,290	175,000 e	158,400
Copper:						
Mine output, concentrate, Cu content	do.	6	2	2 e	2 e	2 e
Metal, refined, primary and secondary e	do.	8,000	8,100	5,800 [3]	--	--
Gallium, metal e	kilograms	500	500	500	500	500
Gold, metal	do.	157	53	50	50 e	--
Iron and steel:						
Iron ore:						
Gross weight		888	1,300	1,324	1,000	1,000
Metal content		238	175	200	500	500
Concentrate, gross weight		435	326	400	300	300
Metal:						
Pig iron		3,255	3,533	3,892	3,800	3,681
Ferroalloys, total electric furnace e, [4]		95	95	95	95	95
Ferrochromium	metric tons	5,968	5,695	1,924	2,000	867
Ferrosilicon e	do.	50,000	50,000	50,000	50,000	50,000
Steel, crude		3,989	4,275	4,709	4,564	4,242
Semimanufactures e		3,600	3,500	3,500	3,500	4,000
INDUSTRIAL MINERALS						
Barite, concentrate	metric tons	14,450	25,820	12,000 r	27,060 r	25,000
Cement, hydraulic		3,123	3,141	3,147	3,158	3,499
Clays:						
Bentonite	metric tons	82,915	66,128	74,938	69,252	75,752
Kaolin	do.	34,700	33,000	35,000	89,420 r	85,000
Refractory	do.	3,000	3,000 e	--	--	--
Ceramic	do.	59,000	55,000	50,000	50,000 e	50,000 e
Dolomite		1,471	1,357	1,250	1,117	1,021
Gypsum and anhydrite, crude	metric tons	169,000	121,700	93,800 r	127,100 r	120,000
Lime, hydrated and quicklime		816	911	847	961	946
Magnesite, concentrate	metric tons	961,000	930,000	397,259	404,776	447,700
Nitrogen, N content of ammonia	do.	261,000 r	410,000 r	288,000 r	275,223 r	295,286
Perlite	do.	14,910	18,630	15,000 r	23,840 r	20,000
Salt	do.	123,000	97,400	133,100 r	121,600 r	120,000
Sand and gravel	thousand cubic meters	1,272	1,399	1,300	1,300 e	1,800
Stone:						
Limestone and other calcareous stones for cement		3,596	3,694	3,453	4,501	6,034
Crushed stone	thousand cubic meters	4,602	4,715	5,075	4,472	6,541
Talc	metric tons	2,600	2,290	4,200 r	7,100 r	7,000
Zeolites	do.	23,000	28,000	25,000	--	--
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite		3,424	3,401	3,077	2,952	2,511
Coke: e						
Metallurgical		1,500	1,500	1,500	1,500	1,500
Unspecified		200	200	200	200	200
Gas, manufactured, coke oven	million cubic meters	213	206	210	200	200
Petroleum:						
Crude:						
As reported		54	53	48	50	50
Converted e	thousand 42-gallon barrels	400	400	350	350	350
Refinery products e	do.	40,000	40,000	40,000	44,500	44,500

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, arsenic, diatomite, feldspar, illite, sodium compounds, sulfur, and sulfuric acid are produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]May include some FeCrSi and FeNi, if any was produced.

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TABLE 11
SLOVAKIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies[1]	Location of main facilities[2]	Annual capacity
Aluminum		ZSNP Aluminum Works (Slovalco)	Ziar and Hronom, central Slovakia	108
Antimony:				
Ore		Liptovska Dubrava	Central Slovakia	50
Do.		Pezinok	Western Slovakia	50
Smelter		Vajskova	Central Slovakia	2
Cement		Lietavska Lucka, Stupava, and Turna	Slovakia	5,400
Coal:				
Brown		Hornonitranske Bane, a.s.	Prievidza, central Slovakia	3,500
Do.		Bana Dolina, a.s.	V'lky Krtis, southern Slovakia	500
Lignite		Bana Zhorie, a.s.	Holic, western Slovakia	400
Copper:				
Ore		Slovinky, Hodrusa-Hamre, and Rudnany	Central Slovakia	500
Refinery		Krompachy	do.	27
Gallium	kilograms	ZSNP Aluminum Works (Slovalco)	Ziar and Hronom, central Slovakia	4,000
Iron:				
Ore		Nizna Slana and Rudnany	Central Slovakia	1,600
Concentrate		do.	do.	1,300
Lead-zinc, ore		Banska Stiavnica	do.	200
Magnesite		SMZ a.s. Jelsava	Eastern Slovakia	350
Do.		Slovmag a.s., Lubenik	Central Slovakia	150
Petroleum, refinery		Bratislava, Dubova	Slovakia	NA
Salt		Solivary a.s., Presov	Eastern Slovakia	150
Steel, crude		U.S. Steel Kosice	Eastern Slovakia, Kosice	4,000
Do.		Zeleziarne Podbrezova a.s.	Slovakia, Podbrezova	600

NA Not available.
[1]All mining companies are Government owned.
[2]Names and locations of mines and crude oil refineries are identical.

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The Mineral Industries of the Commonwealth of Independent States

Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan

By Richard M. Levine and Glenn J. Wallace

The Commonwealth of Independent States (CIS) was created in December 1991 by Republics of the former Soviet Union and then extended to all the former Soviet Republics except the Baltic states of Estonia, Latvia, and Lithuania. In the adopted Declaration, the participants of the CIS declared their interaction to be based on the principle of the sovereign equality of all members and that the member states were independent and equal subjects of international law. The CIS is not a state and it does not have supranational powers. In 2005, the members of the CIS were Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. On August 26, 2005, Turkmenistan discontinued permanent membership and became an associate member.

The stated purpose of the CIS is to provide a common economic space in the CIS region. Although they are pledged to economic integration, the countries of the CIS have taken few actual measures to make the CIS a functioning integrated economic bloc similar to the European Union (EU).

ARMENIA

Armenia was a major producer of molybdenum. The Zangezur copper-molybdenum complex possesses large molybdenum reserves that are concentrated in the Kadzharan deposit. Besides molybdenum, Armenia has significant deposits of copper and gold; smaller deposits of lead, silver, and zinc; and deposits of industrial minerals, including basalt, diatomite, granite, gypsum, limestone, and perlite. Table 7 is a list of the country's major mineral reserves.

In 2005, seventeen mining and metallurgical enterprises were in operation; the largest enterprises mined copper and molybdenum ore or extracted gold from tailings. The country also produced aluminum foil based on raw materials imported from Russia and had a diamond cutting industry using imported raw materials (Mining Journal, 2005). The country had almost no domestic fuel production and relied for electric power on a nuclear powerplant and hydroelectric plants. It imported fuel for its nuclear powerplant and natural gas from Russia.

The value of mineral production in 2005 totaled $180 million or about 5% of the gross domestic product (GDP). Mining and nonferrous metallurgy accounted for 55% of the value of industrial production (table 1). The mineral sector accounted for 11% of the value of the country's capital stock (table 2).

Production

In 2005, in the aggregate, the volume of metallic ores mined decreased although nonmetallic ore production increased. The volume of output in both the ferrous and nonferrous metallurgical sectors increased compared with output in 2004 (table 3). The output volume of individual mineral commodities with respect to ouput in 2004 varied by commodity (table 4).

Structure of the Mineral Industry

The diamond cutting industry appeared to be in flux; it was not possible to verify the continuing existence of a number of diamond cutting enterprises and a few new diamond cutting enterprises apparently were established. Russia's major aluminum company RUSAL invested more than $100 million in Armenal, which was owned by RUSAL. The Armenal foil plant reopened in December 2005 after being closed for about 1 year for renovation. Plans called for the plant to produce 25,000 metric tons per year (t/yr) of foil. The plant, which would be supplied with raw material from RUSAL, was expected to produce 12% of all foil produced in the CIS by 2007 (table 5; Azom.com, 2005§[1]).

Trade

In terms of value, cut diamond was the country's leading mineral export followed by copper and ores and slags, of which molybdenum ores and concentrates had the most value. The country reported significant exports of iron and steel, which were either transshipments or scrap as the county had no domestic steel industry (table 6).

Outlook

Further development of the country's mineral production sector is projected as additional funds become available for mineral sector development. Mineral production has been increasing (except for in the diamond-cutting industry) and the country is making a particular effort to attract investment in its mining sector. Molybdenum output is expected to increase as a result of a successful privatization program that involved

[1]References that include a section mark (§) are found in the Internet Reference(s) Cited sections.

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a $200 million investment that has enabled the Zangezur copper-molybdenum complex to begin reequipping its mining and processing operations in 2005. The goal is to increase the ore-processing capacity at the Kadzharan deposit by 50% to between 12.5 and 13 million metric tons per year (Mt/yr) of ore by 2008. The Armenian Copper Program (ACP) is also in the process of having the large Teghout copper-molybdenum deposit reevaluated and, if it proves feasible for development, the deposit will be second only to the Kadzharan deposit in the size of its copper and molybdenum reserves. International companies are investing in developing gold deposits in Armenia, including Ararat Gold Recovery Company (a 100% subsidiary of Sterlite Ltd. of Canada) and United States-based Global Gold Corp. Production of aluminum foil is also expected to increase with the restarting of the Armenal plant.

Reference Cited

Mining Journal, 2005, Armenia: London, United Kingdom, Mining Journal special publication, November, 12 p.

Internet Reference Cited

Azom.com, 2005 (December 9), Rusal's Armenal begins production, accessed January 22, 2007, at URL http://www.azom.com/news.asp?newsID=4520.

Major Sources of Information

Ministry of Trade and Economic Development
Ministry of Nature Protection of the RA
Armenian Development Agency
National Statistical Service of the Republic of Armenia

AZERBAIJAN

Azerbaijan produced a range of metals and industrial minerals, including such metals as alumina, aluminum, lead, steel, and zinc. Its major importance as a world mineral producer, however, was based on its petroleum extracting industry. The country has been a significant oil producer for more than a century, but recent focus has been on developing offshore resources in the Caspian Sea. Production from the country's Soviet-era fields are in decline, but since independence, foreign direct investment in offshore fields had revitalized the country's oil sector through the development of large-scale new projects and the refurbishment of older projects. In 2005, Azerbaijan had signed more than 20 major agreements to develop oilfields with approximately 30 companies from 15 countries (U.S. Energy Information Administration, 2006§).

Oil extraction and refining accounted for more than 75% of the value of industrial production (table 8). The oil extraction and refining sectors and the metallurgy and metal fabrication sectors employed more than 60,000 people in 2005 (table 9). The country was becoming a major producer of oil and was producing far more oil than it consumed, but its natural gas production in 2005 was still significantly below its consumption (table 10). The country was increasing its steel products production at the Baku Steel company, which was a privately owned company that produced steel products from steel scrap.

Production

In 2005, production increased for practically all mineral commodities. Crude petroleum production increased by more than 43% compared with that of 2004 (table 11). The country was developing its steel industry, although it is still on a small scale.

Trade

Fuels accounted for 76% of the value of exports in 2005 (table 13). The country's major export was crude petroleum, almost all of which was sold on world markets rather than supplied to other CIS countries. Other mineral exports included petroleum refinery products and alumina (tables 14, 15). The country imported a variety of mineral commodities, including natural gas (table 15).

Mineral Resources

Azerbaijan's major mineral wealth is in its oil and gas reserves. Offshore hydrocarbon structures in the Caspian Sea accounted for most of the country's oil and gas production. Azerbaijan's proven crude oil reserves were estimated to range from 7 billion to 13 billion barrels (Gbbl) [or from about 950 millon meteric tons (Mt) to 1.8 billion metric tons (Gt)] based on various industry journals and Government sources. The State Oil Company of the Azerbaijan Republic (SOCAR) has estimated that proven reserves are 17.5 Gbbl (about 2.4 Gt) using the Soviet reserve classification system. This evaluation was not based on market economy criteria and may include resources that are not economically viable. Estimates of natural gas reserves also vary. According to the Oil & Gas Journal, Azerbaijan has proven natural gas reserves of roughly 30 trillion cubic feet (about 850 billion cubic meters, and BP p.l.c. estimates that the country has 48 trillion cubic feet (about 1.4 trillion cubic meters) of proven gas reserves (U.S. Energy Information Administration, 2006§).

Outlook

Although some effort has been made to promote balanced mineral development of all the country's mineral resources, the country's economic development has depended primarily on the development of its large offshore oil and gas resources. These resources are expected to be the country's chief source of revenue for the coming decades.

In 2004, Azerbaijan exported approximately 211,000 barrels per day (bbl/d) of oil. Exports are expected to more than double to 478,000 bbl/d in 2006 and to reach as high as 1.1 million barrels per day (Mbbl/d) by 2008 (U.S. Energy Information Administration, 2006§).

Azerbaijan was a net natural gas importer in 2005. The country is expected to become a significant gas exporter following the development of the Shah Deniz natural gas deposit, which is considered to be one of the world's largest natural gas field discoveries of the past 20 years. According to BP (the project operator), Shah Deniz has potential recoverable reserves of about 15 trillion cubic feet (about 424 billion cubic

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meters) of natural gas and 600 million barrels [(Mbbl)—about 82 Mt] of condensate. Other industry and trade sources have estimated that the field contains as much as 35 trillion cubic feet (almost 1 trillion cubic meters) of gas. The field is being developed by the Shah Deniz consortium, whose members include BP, LukAgip, National Iranian Oil Company (NICO) International, SOCAR, Statoil ASA of Norway, TotalFinaElf, and Türkiye Petrolleri Anonim Ortaklig (TPAO) of Turkey (U.S. Energy Information Administration, 2006§).

In the first phase of the Shah Deniz field's development, production of natural gas for export was expected to begin in late 2006. In the second phase, according to BP, the Shah Deniz project could produce an additional 1 trillion cubic feet per year (about 28 billion cubic meters per year) of natural gas by as early as 2015 (U.S. Energy Information Administration, 2006§).

Although Azerbaijan lacks any infrastructure for the export of natural gas, efforts were underway to secure export routes and customers for gas deliveries beginning in 2006. The main conduit for Azerbaijan's natural gas exports would be the South Caucasus Pipeline, also known as Baku-T'bilisi-Erzurum, which would run parallel to the Baku-T'bilisi-Ceyhan oil pipeline for most of its route before connecting to the Turkish gas pipeline network near the town of Horasan in Turkey. Pipeline construction began in late 2004 and was scheduled to be completed during the first quarter of 2007. The pipeline was expected to carry 233 billion cubic feet per year (about 6.6 billion cubic meters per year) initially; this volume could be increased later to up to 700 billion cubic feet per year (about 58 billion cubic meters per year) with the future addition of compression stations (U.S. Energy Information Administration, 2006§).

With the new pipeline infrastructure in place, Shah Deniz would be capable of producing approximately 350 billion cubic feet per year (about 9.9 billion cubic meters per year) of natural gas by 2009. Supplies of natural gas from Shah Deniz and associated gas from the Azeri Chirag Gunashli (AGC) and the Bakhar-2 projects are expected to make Azerbaijan self-sufficient in natural gas and to result in significant export revenues (U.S. Energy Information Administration, 2006§).

Internet Reference Cited

U.S. Energy Information Administration, 2006 (August), Azerbaijan, accessed January 23, 2007, at URL http://www.eia.doe.gov/emeu/cabs/Azerbaijan/Background.html.

Major Sources of Information

State Statistical Committee of the Republic of Azerbaijan
Ministry of Economic Development
Ministry for Industry and Energy Ministry of Ecology and Natural Resources Agriculture
State Oil Company of the Azerbaijan Republic (SOCAR)

BELARUS

Belarus had a number of significant mineral production enterprises, including a steel minimill, a nitrogen production enterprise, and two oil refineries. An oil pipeline that passes through Belarus transported about 70 Mt/yr of Russian oil to Europe. The Belneftekhim State Concern for Oil and Chemicals, which included among its many enterprises the country's oil production, refining, and transport facilities and potash production enterprise, was the largest concern in the country. It included 50 organizations, of which nearly all were enterprises that produced chemical products. The country's only mineral production enterprise that played a major role in world markets was its potash production enterprise Belaruskali, which mined the Starobin deposit. In 2005, Belarus ranked third in the world in potash production.

Production of mineral products, including chemicals and petrochemicals, construction materials, electric energy generation, fuels, and metals accounted for 47.2% of the value of industrial output (table 17). Utilization of current production capacity was almost 100% in every branch of mineral production except oil refining (table18). The Belneftekhim concern accounted for about 19% of the value of industrial output and 25% of the value of exports; it employed about 120,000 people (Belneftekhim, 2007§).

Production

In 2005, production increased for the majority of mineral commodities compared with that of 2004, including potash, for which Belarus was a major world producer (table 19).

Trade

Fertilizers, petroleum refinery products, and iron and steel were Belarus' main mineral commodity exports. Its major mineral imports were iron and steel and mineral fuels (table 21).

Mineral Resources

Belarus has only one mineral deposit of major significance, the Starobin potash salt deposit, which is one of world's largest potash deposits. The Starobin deposit contains camalite (magnesium-bearing salt), edible rock salt, and sylvinite (potash-bearing salt). The potash salts are contained within the rock salt layers. Several dozen potash levels are found at the deposit. The commercial part consists of four levels. These commercial levels occur at depths of from 400 to 1,200 meters (m) and more. Their thickness varies from 4 to 20 m (Production Almagamation Belaruskali, 2005b§).

Outlook

Belarus' main mineral production enterprise, the potash producer Belaruskali, has been put on a list of state-owned companies that cannot be privatized (Creon, 2006§). Plans for Belaruskali until 2012 call for the improvement of its export potential by increasing its potash fertilizer production capacity to 9 Mt/yr. To attain this target, the following projects would have to be completed: construction of the Beryozovski and Krasnaya Sloboda Mines to maintain and extend reserves owing to decreasing reserves at the No. 1 and 2 mining enterprises; modernization and reconstruction of existing mines, processing plants and auxiliary shops; and reduction in the environmental

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impact of mining and processing in the area of Soligorsk (Production Almagamation Belaruskali, 2005a§).

With the aid of foreign partners and investors, planned facility reconstruction is in progress in the oil refining sector. The modernization is intended to deepen the oil refining process and to switch to essentially new technologies to address increasing environmental challenges (Belnefetkhim, 2007§).

Internet References Cited

Belneftekhim, 2007, The Concern, accessed January 8, 2007, at URL http://www.kali.by/english/genesis.html.

Creon, 2006 (November 20), Belaruskaliy maintains to be state owned, accessed January 5, 2007, at URL http://www.creon-online.ru/En/?ID=466431-35k.

Production Almagamation Belaruskali, 2005a, Development perspectives of Belaruskali, accessed January 25, 2007, at URL http://www.kali.by/english/future.html.

Production Almagamation Belaruskali, 2005b, Original of a deposit, accessed January 24, 2007, at URL http://www.kali.by/english/genesis.html.

Major Sources of Information

Belneftekhim State Concern for Oil and Chemicals
Ministry of Natural Resources and Environmental Protection
Ministry of Statistics and Analysis of the Republic of Belarus

GEORGIA

During the Soviet period, a range of minerals were mined in Georgia, which included arsenic, barite, bentonite, coal, copper, diatomite, lead, manganese, zeolite, and zinc, among others. Most of these commodities were still being produced in 2005, although in lesser quantities. The country had been a major producer of high-grade manganese ore for about a century, although ore reserves were being depleted. Part of the manganese was used within Georgia for ferroalloy production. Following the dissolution of the Soviet Union, the level of mineral production in Georgia declined sharply. Although production in the mineral industry was reviving in 2005, Georgia did not produce any mineral products in quantities that would be of more than regional significance.

Georgia's main role in the world mineral supply was to serve as a transport route for oil and gas shipments out of the Caspian region to world markets. Three of the new large oil and gas export pipelines that had been or were being constructed in the Caspian region pass through Georgia. These three are the Baku-Tbilisi-Ceyhan, the Baku-Tbilisi-Erzurum, and the Baku-Supsa ("Western Early Oil Route") pipelines. No routes were planned to cross Armenia owing to Azerbaijan's troubled relationship with Armenia.

In 2005, Georgia had 148 enterprises that were involved in mining and quarrying out of a total of 4,632 industrial enterprises, which comprised 3.2% of the total number of industrial enterprises. Seven of these 148 enterprises were state owned and the rest were private. The distribution of these enterprises based on the type of mineral extraction is shown in table 22. In 2005, the labor force involved in mining and quarrying totaled 8,600 out of a total industrial labor force of 94,300, or 8.6% of the industrial labor force. State-owned mining and quarrying enterprises employed 5,700 people and private enterprises employed 2,900 people. The distribution of the labor force among mining and quarrying enterprises is shown in table 23. Mining and quarrying contributed 10.4% of the total value of industrial production in 2005. The distribution of the value of industrial production contributed by type of mining activity is shown in table 24.

Of the total value of output for mining and quarrying, state-owned enterprises produced about one-third of the value of output, and the remaining two-thirds was produced by privately owned enterprises. Of the total value of industrial capital stock, mining and quarrying enterprises accounted for 3.4% of the value. The distribution of the value of capital stock based on the type of mining and quarrying is shown in table 25 (State Department for Statistics of Georgia, 2006§).

Trade

Georgia exported a large percentage of its major mineral products. These products included copper ores and concentrates, ferroalloys produced from domestically produced manganese ore, and nitrogenous fertilizers. The country also exported significant quantities of ferrous scrap and waste. Georgia's major mineral imports were oil and gas. The quantity and value of exports and imports of mineral commodities are listed in tables 28 and 29.

Mineral Resources

Georgia has more than 300 explored mineral deposits, only about one-half of which have been brought into production. For the past 100 years, the manganese ore deposits near the town of Chiatura have represented a significant source of manganese ore production. Chiatura ores supplied the county's Zestafoni ferroalloys plant. The Chiatura deposit's resources were estimated to be 215 Mt of manganese ore, of which about one-half has been depleted. The country has 11 explored oilfields with reportedly 28 Mt of oil resources; larger oilfields are also thought to exist. Georgia reportedly has more than 400 Mt of coal resources. The Black Sea coast in Adjaria is thought to contain large gasfields with 8.5 billion cubic meters of resources already explored and potential resources estimated to be 125 billion cubic meters. The country also has resources of arsenic, barite, copper, diatomite, dimension stone, marble, and lead-zinc, as well as raw materials for producing cement (American Chamber of Commerce in Georgia, 2005§). Important deposits include the Askana bentonite clay deposit in Ozurgeti, the Kisatibi diatomite deposit in the Akhaltsikhe District, the Kvaisa zinc deposit in the Java district, the Luhkumi arsenic deposit in the Ambrolauri district, and the Madneuli polymetallic (barite, copper, lead-zinc, pyrite, silver, sulfur, gold bearing quartzites) deposits in the Bolnisi region (American Chamber of Commerce in Georgia, 2005§).

Outlook

Although the Georgian economy has experienced significant economic growth, growth in the mining and metallurgical sector has lagged behind that of the overall economy. Georgia's

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major revenues from minerals are expected to derive from its role as a transport route for Caspian Sea hydrocarbons. Oilfield and gasfield development could take place off the Black Sea shelf as a number of major international companies are assessing the region's production potential. Only two mining enterprises are operating in Georgia—the Chiatura manganese enterprise and the Madneueli polymetallic mining enterprise. Both had previously lacked investment resources to introduce modern technology that would enable them to produce near their potential. In 2005, however, a joint venture of Austrian, Georgian, and Russian bidders reportedly won the privatization tender for the manganese mining enterprise for $132 million, and Stanton Equities Corporation reportedly won a privatization bid for a gold mine at Madneuli (American Chamber of Commerce in Georgia, 2005§).

Internet References Cited

American Chamber of Commerce in Georgia, 2005 (October 19), Investment guide, accessed January 19, 2007, at URL http://www.investmentguide.ge/pages/country_overview/geography/mineral_resources.
State Department for Statistics of Georgia, 2006, Industry in Georgia, accessed January 18, 2007, at URL http://www.statistics.ge/index.php?plang=1.

Major Sources of Information

Ministry of Environmental Protection and Natural Resources
Ministry of Economic Development
Ministry of Fuel and Energy

KAZAKHSTAN

Kazakhstan ranks second only to Russia among the countries of the CIS in its quantity of mineral production. It is endowed with large reserves of a wide range of metallic ores, industrial minerals, and fuels, and its metallurgical sector is a major producer of a large number of metals from domestic and imported raw materials. In 2005, its metal mining sector produced bauxite, chromite, copper, iron, lead, manganese, and zinc ores, and its metallurgical sector produced such metals as beryllium, bismuth, cadmium, copper, ferroalloys, lead, magnesium, rhenium, steel, titanium, and zinc. The country produced significant amounts of other nonferrous and industrial mineral products, such as alumina, arsenic, barite, gold, molybdenum, phosphate rock, and tungsten. The country was a large producer of mineral fuels, including coal, natural gas, oil, and uranium.

The country's economy is heavily dependent on the production of minerals. Output from Kazakhstan's mineral and natural resources sector for 2004 (the latest year for which data were available) accounted for 74.1% of the value of industrial production, of which 43.1% came from the oil and gas condensate extraction (table 30). In 2004, the mineral extraction sector accounted for 32% of the GDP, employed 191,000 employees, and accounted for 33.1% of capital investment and 64.5% of direct foreign investment, of which 63.5% was in the oil sector (International Monetary Fund, 2005).

Since the breakup of the Soviet Union, Kazakhstan has been perceived globally as a supplier of mineral commodities, which include oil, nonferrous metals, and uranium. Kazakhstan has been developing a rich mineral resource endowment. Intensive raw materials production and exports have helped the economy to overcome economic crises and ensured high rates of economic growth during the past 3 years (International Monetary Fund, 2005).

The economy of Kazakhstan has been growing owing to the state policy of attracting foreign investment into its extraction industries. Kazakhstan was the first CIS country assigned with investment sovereign rating, and The World Bank has listed Kazakhstan among the 20 most attractive countries for investment. As a small economy with large fuel and mineral resources, however, Kazakhstan has not been particularly attractive for investment in the manufacturing sector, which makes the country highly vulnerable to fluctuations in commodity prices (World Bank, The, 2006§).

In view of the danger of the economy not using effectively the excess profits from the extracting sectors and foreseeing a possible negative effect from a sharp downfall of oil prices, the Government established the National Fund to accumulate surplus oil revenues. The revenues in the Fund are to be used for the overall development of the national economy (World Bank, The, 2006§).

Environment

Kazakhstan faces a number of environmental challenges, including industrial pollution, land degradation and desertification, and contamination from its former role in nuclear weapons development and testing in the Semipalatinsk region. Significant improvements in the environmental situation of the Northern Aral Sea area has been made owing to dam construction and river flow regulation (World Bank, The, 2006§).

Production

In 2005, Kazakhstan increased its production of petroleum (its major mineral commodity in terms of value) compared with production in 2004. Results were mixed regarding the production of other mineral commodities, with production increasing for some commodities, such as alumina, chromite, silver, titanium sponge, uranium, and zinc metal, but decreasing for others, such as copper metal, iron ore, lead metal, and steel (table 31).

Structure of the Mineral Industry

Kazakhstan's law holds that no sector of the economy is fully closed to investors, and, in 2005, a large number of Kazakhstan's mineral production enterprises had significant foreign ownership. In 2005, the Government of Kazakhstan also maintained ownership in a number of mineral production enterprises; the percentage of ownership varied depending on the enterprise (U.S. Department of State, 2006§). Despite being open to foreign investment and even listed on Western stock exchanges, the ownership structure of some major mineral producing enterprises was not entirely transparent

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(Roberts, 2006§). Table 32 is a list of major mineral production enterprises in Kazakhstan.

Trade

In 2005, fuel and oil products comprised 69% of the value of exports. Ferrous and nonferrous metals were other significant export products. The value of commodity exports from the mineral extraction sectors increased considerably in 2005, owing to an increase in the price of oil and other mineral commodities (World Bank, The, 2006§). Table 33 is a summary of Kazakhstan's major mineral exports and imports.

Mineral Resources

Kazakhstan's mineral resource base is characterized by a large number of oilfields and gasfields and by a large variety of mineral resources. The country ranks among the world's leading countries in its reserves of chromite, lead, zinc, and, uranium; it also has significant reserves of bauxite, copper, gold, iron ore, manganese, natural gas, and petroleum. According to data reported from Kazakhstan, the country is one of the 10 leading countries in the world for a significant number of mineral resources (table 34).

Within the CIS (based on the reserve classification system that was used in the Soviet Union and then by many of its successor states), Kazakhstan ranked first in its reserves of chromite and lead, possessing 97% and 38%, respectively, of all CIS reserves. The country ranked second in manganese, nickel, oil, phosphate rock, silver, and zinc, and third in coal, gas, gold, and tin (Embassy of Kazakhstan to the United States and Canada, 2007§).

Commodity Review

Kazakhstan was a major world producer of chromite, copper, lead and zinc, petroleum, and uranium.

Metals

Chromium.—Kazakhstan was the world's second ranked chromite producer. Production was centered in the Aqtobe region of northwestern Kazakhstan at the Khromtau complex. Chromite production was significantly expanding with the aid of Western investment. London-based Oriel Resources Plc acquired 100% of the Voskhod chromite project in February 2005 and, based on the positive results of a feasibility study, planned to fast-track development of the Voskhod project. Discovered in 1963, the Voskhod chromite deposit lies within the Khromtau District of the Aqtobe Region. Although surrounded by a group of existing mines, it had never been worked. The ore grade reportedly averages 48% Cr_2O_3 with concentrate upgraded to 57% Cr_2O_3. Production from Voskhod was expected to be 900,000 t/yr; production would begin in 2008 and continue for 14 years. The Voskhod Mine was projected to be one of the world's leading suppliers of high-grade chromite. Oriel subsequently was awarded an extension to the Voskhod contract license area to include the Karaagash deposit which has, according to the former Soviet reserve classification system, C2 and P1 classified resources of some 7.8 Mt. Assuming positive results of a confirmatory drilling program, theses resources could extend mining beyond Voskhod's projected 20-year life (Oriel Resources Plc, 2006§).

Copper.—Kazakhmys plc, which was the firm that controlled most copper mining and metal production in the country, was engaged in a number of projects to ensure growth in the short term and provide for reserve replacement in the longer term. The majority of these projects was expected to begin production in the near or medium term and would include both new mine development and expansion of existing mines. The new mines included the Artemovskoye (which was part of the East Region complex), which was completed ahead of schedule and had the capacity to produce 28,000 t/yr of copper and 98,000 t/yr of zinc; the Zhaman-Aybat (which was part of the Zhezkazgan mining-metallurgical complex), which was under construction and has reserves of 75.3 Mt of ore that contains 1.069 Mt of copper; and the Aktogay (which was part of the Balkhash mining-metallurgical complex), which was being evaluated for development of an open pit to mine that was expected to produce 1.614 Gt of ore at an average grade of 0.36% copper, or 5.810 Mt of copper. Expansion of existing mines would include that of the East Saryoba underground mine (which was part of the Zhezkazgan complex), the Akbastau and the Kosmurun Mines (which were part of the East Region complex), and the Taksura open pit (which was part of the North Mine) (Kazakhmys plc, 2006§).

Lead and Zinc.—Kazzinc JSC operated most of the country's lead and zinc mining and metallurgical enterprises. It also produced copper and precious metals. It employed about 22,000 people in mining, beneficiation, metallurgy, power generation, and auxiliary production. The company was established in 1997 through the merger of eastern Kazakhstan's three main nonferrous metals companies—Leninogorsk (now Ridder) Polymetallic complex, Ust-Kamenogorsk Lead and Zinc complex, and Zyrianovsk Lead Complex. The controlling block of shares in Kazzinc was sold by the state to the private sector, with Glencore International AG of Switzerland becoming the company's main investor (Kazzinc JSC, 2006a§). In addition to Kazzinc, ZAO Yuzhpolimetal Corp. produced about 60,000 t/yr of lead metal from its Shymkent lead plant; and Kazakhmys produced more than 20,000 t/yr of zinc metal at the Balkhash zinc plant (Notarov, 2005).

Kazzinc's development strategy called for it to join the ranks of the world's leading producers of lead and zinc. Almost all Kazakhstan's lead and zinc production was exported, which placed Kazakhstan already among the world's leading lead and zinc exporting countries. In 2005, Kazakhstan's lead and zinc producing enterprises were operating below capacity. The Ust-Kamenogorsk complex had the capacity to produce more than 150,000 t/yr of lead and 240,000 t/yr of zinc; the Ridder complex, 25,000 t/yr of lead and 110,000 t/yr of zinc; and the Balkhash zinc plant, 100,000 t/yr of zinc. The Shymkent lead plant was working far below capacity owing to a lack of raw material (Notarov, 2005).

Kazzinc mined lead-zinc ores from the Maeeyevskoye, the Ridder-Sokol'noye, and the Tishinskoye deposits, and processed lead and zinc at the Ridder and the Ust-Kamenogorsk

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complexes. Plans called for beginning mining in 2006 at the Shaimreden deposit in Kustanay oblast, which would enable Kazzinc to produce an additional 60,000 t/yr of zinc (Notarov, 2005). In the fourth quarter of 2004, Kazzinc began production at the new Shubinsky mining subsidiary, which would operate the Shubinsky underground mine in the vicinity of Ridder. Reserves at the Shubinskoe deposit were estimated to be 1.5 Mt of lead-zinc and copper ores (Kazzinc JSC, 2006b§).

Mineral Fuels and Related Materials

Petroleum.—Kazakhstan has the Caspian Sea region's largest recoverable crude oil reserves. In 2005, its production accounted for almost two-thirds of the approximately 2 Mbbl/d that was produced by CIS countries in the Caspian region. The country was poised to become an even more significant supplier to world oil markets in the next decade. Kazakhstan produced approximately 1.29 Mbbl/d of oil in 2005 and consumed 222,000 Mbbl/d, resulting in net exports of more than 1 Mbbl/d. The Kazakhstan Government projected increasing production levels to about 3.5 Mbbl/d by 2015, which would come mainly from production of about 1 Mbbl/d from the to-be-developed offshore Kashagan field, 700,000 Mbbl/d from the onshore Tengiz field, 600,000 Mbbl/d from the to-be-developed onshore Kurmangazy field, and 500,000 Mbbl/d from the onshore Karachaganak field. The remainder would come from the development of smaller fields. Major growth would come from an approximately 75% increase in production from the Tengiz field and by development of the Kashagan field, which would add an additional 1 Mbbl/d after 2010 (U.S. Energy Information Administration, 2006§).

Uranium.—Kazakhstan was the third ranked country in the world in volume of uranium production. The company Kazatomprom was the fourth ranked uranium producer in the world (Dzhakizhev, 2004).

Approximately one-fifth of the world's uranium reserves are located in Kazakhstan. Total resources of uranium are more than 1.5 Mt, and more than 1.1 Mt can be mined by in situ leaching. Projections made by the head of Kazatomprom called for uranium production in Kazakhstan to increase to 6,465 metric tons (t) in 2007, 8,300 t in 2010, and 9,300 t in 2015 from about 4,350 t in 2005 (Dzhakizhev, 2004).

At the Stepnogorsk mining and chemical complex, which was Kazatomprom's main production enterprise, plans called for increasing production by expanding the volumes of uranium production in Mining Group No. 1, further developing the Vostok field, and completing development of the Zvezdnoye field (Kazatomprom, 2007§).

Outlook

The large predicted oil resources of the Kazakhstan sector of the Caspian shelf will require a significant amount of investment to develop. The required cumulative investment could be as much as $160 billion, of which about $10 billion would be for the initial stage of exploration, including field appraisal. Western companies already have invested more than $7 billion. A constraint to obtaining investment funds to develop the Caspian shelf is the lack of resolution of the territorial status of the Caspian Sea in regards to the demarcation lines and the ownership rights of the bordering states. This issue may have been partially resolved, however, with the agreement between Kazakhstan and Russia to partition the seafloor of the Caspian along the midline between the two countries. Similar agreements have been concluded between Kazakhstan and Azerbaijan, and between Azerbaijan and Russia (Embassy of Kazakhstan to the United States and Canada, 2007§). Also, in the energy sector, Kazakhstan will play an increasingly important role as one of the world's main suppliers of uranium.

Although Kazakhstan has adequate lead and zinc reserves to allow it to expand production through the next decade, expansion will depend on Kazakhstan's companies being able to acquire financing and the participation of foreign firms in developing large lead and zinc deposits (Notarov, 2005).

References Cited

Dzhakizhev, Moukhtar, 2004, Uranium production in Kazakhstan as a potential source for covering the world uranium shortage: World Nuclear Association Annual Symposium, London, September 8-10, World Nuclear Association 2004, 17 p.

International Monetary Fund, 2005, Republic of Kazakhstan Statistical Appendix: International Monetary Fund Country Report No. 05/239, July, 39 p.

Notarov, Aneksiy, 2005, Kaztsink—v pogone za liderami [Kazzinc—Chasing the leaders]: Metally Evrazii [Eurasian Metals], no. 5, p. 78-80.

Internet References Cited

Embassy of Kazakhstan to the United States and Canada, 2007, Mineral wealth, accessed February 9, 2007, at URL http://www.kazakhembus.com/MineralWealth.html.

Kazakhmys plc, 2006 (November 17), Future projects, accessed February 9, 2007, at URL http://www.kazakhmys.com/about_future.php.

Kazatomprom, 2007, Stepnogorsk mining and chemical complex, accessed February 13, 2007, at URL http://www.kazatomprom.kz/cgi-bin/index.cgi?p42&version=en.

Kazzinc JSC, 2006a, Company profile, accessed February 13, 2007, at URL http://www.kazzinc.com/index_next.php?id=1&lang=1.

Kazzinc JSC, 2006b, News, accessed at February 13, 2007, at URL http://www.kazzinc.com/index_next.php?id=7&lang=1.

Oriel Resources Plc, 2006, Chrome and nickel, accessed February 14, 2007, at URL http://www.orielresources.com/aboutoriel.asp.

Roberts, S.R., 2006, Who controls Kazakhmys?, accessed February 22, 2007, at URL http://roberts-report.blogspot.com/2006/08/who-controls-kazakhmys.html.

U.S. Department of State, 2006, 2006 investment climate statement, accessed February 22, 2007, at URL http://www.state.gov/e/eeb/ifd/2006/62359.htm.

U.S. Energy Information Administration, 2006 (October), Kazakhstan, accessed February 13, 2007, at URL http://www.eia.doe.gov/emeu/cabs/Kazakhstan/Oil.html.

World Bank, The, 2006, Kazakhstan, Country Brief, accessed February 9, 2007, via URL http://www.worldbank.org.

Major Sources of Information

Agency of Statistics of the Government of Kazakhstan
Kazakhmys plc
Kazatomprom
Kazzinc JSC
Ministry of Energy and Mineral Resources
Ministry of Environmental Protection
Ministry of Geology
Ministry of Industry and Trade

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KYRGYZSTAN

During the Soviet period, Kyrgyzstan was the main producer of mined mercury and of mercury and antimony metal. Following the dissolution of the Soviet Union, the country's leading mineral sector became the gold mining sector with the development of the Kumtor gold deposit by Canada's Cameco Corp., which concluded an agreement for project development with the Kyrgyz Government in 1994. On January 5, 2004, Cameco Corp. and the Kyrgyz Government announced their agreement to transfer all the assets of the Kumtor Gold Company to a new Canadian company called Centerra Gold Inc. (Centerra Gold, Inc., 2006a§). Besides Kumtor, the country's main mining enterprises were the Kadamzhay antimony mining and metallurgical complex, the Khaydarkan mercury mining and metallurgical complex, and the Makmal gold mining complex.

The Government participated directly in the mining sector through equity holdings in the Government-owned mining company Kyrgyzaltlyn. Kyrgyzaltyn's holdings include the Kadamzhay antimony mining and metallurgical complex, the Kumtor Operating Company, the Makmal gold mining complex, the Sary-Dzhasskiy gold mine, the Soltan-Sary gold mine, the Terek-Sayskiy gold mine, and others. Centerra owned 100% of the Kumtor Gold Company and the Government of Kyrgystan (through Kyrgyzaltyn) owned a 15.6 % share of Centerra (Mines & Communities, 2005§). Kumtor's significance to Kyrgyzstan's economy was large. It accounted for approximately 10% of Kyrgyzstan's GDP and about one third of all export earnings. The Kumtor gold mine employed 1,600 people (Smith, 2005). The Cameco/Centerra investment in the Kumtor gold mine was one of the largest single foreign investments in Central Asia (Canadian Embassy in Alamaty, 2006§). The mine had been the subject of complaints about environmental issues, worker safety, and financial transparency, however, which led to protests and work stoppages in 2005.

Excluding Kumtor, which is not included in some of some of Kyrgyzstan's national statistical economic data, the other parts of the mining sector did not make a significant contribution to the GDP. Even excluding Kumtor, the mining sector was a significant recipient of foreign direct investment, which was primarily directed towards the gold sector.

Production

In 2005, gold production at the Kumtor mine fell by almost 25% compared with that of 2004. Excluding Kumtor, the value of all mineral production in 2005 decreased by 13.9%. The value of the extraction of energy resources decreased by 17.7% compared with that of 2004 but increased by 17.3% for the extraction of other mineral resources. The value of output for the metallurgical sector and finished metal products decreased by 23.8% and included a large decrease in the value of output of antimony and antimony products (Interfax Statistical Report, 2006). The output of mineral products by physical unit is shown in table 35.

The Kara-Balta mining and metallurgical complex processed molybdenum, refined gold, and uranium. According to agreements signed with the Kazakh Government in the 1990s, Kara-Balta had produced about 450 t/yr of U_3O_8 from uranium concentrate provided by the Stepnoye and the Tsentralnoye Mining Directorates in Kazakhstan. In July 2000, Kazakhstan, Kyrgyzstan, and Russia agreed to form a three-way venture whereby Kara-Balta would process additional uranium concentrate from Kazakhstan's Zarechnoye deposit for the Russian nuclear power industry. In 2004, Kazakhstan stopped supplying Kara-Balta with uranium ore, and uranium processing at Kara-Balta ceased. The Government of Kyrgyzstan tried several times in 2005 to sell the plant, but was unsuccessful (Nuclear Threat Initiative, 2006§).

Mineral Resources

As of December 31, 2005, proven and probable reserves at the Kumtor gold deposit were reported by Centerra Gold to be 154 t (Centerra Gold Inc., 2006c§). Besides Kumtor, as of January 1, 2003, 19 primary and secondary gold deposits were listed on the Government's inventory. Licenses had been granted for the development of 15 deposits. More than 40 commercial or near-commercial gold deposits had been discovered in Kyrgyzstan, and further exploration and deposit evaluation could increase this number.

Most of the gold reserves were concentrated in four major known deposits that were under development. The Kumtor and the Makmal deposits were being mined, and the Jerooy and the Taldy-Bulak deposits were undergoing evaluation. The Makmal deposit was almost depleted. Other smaller high-grade, low tonnage deposits, such as the Solton-Sary and Kuran-Dhzailiau, were also being developed (MBendi Information Services (Pty) Ltd., 2005§).

Outlook

Production from the country's major mineral producing enterprise, the Kumtor gold mine, is projected by Centerra (the company's owner) to increase to about 26 t in 2009 from its 2005 level of 15.6 t. From 2009 onward, production would begin to decrease until it would cease in 2013 (Centerra Gold Inc., 2006b§).

References Cited

Interfax Statistical Report, 2006, Industrial production in Kyrgyzstan down 12.1% in 2005: Interfax Statistical Report, v. 15, issue 6, January 28–February 3, p. 4, 5.

Smith, Graeme, 2005, Cameco unit mines for goodwill in Kyrgyzstan: Globe and Mail (Toronto], July 15, p. B8.

Internet References Cited

Canadian Embassy in Alamaty, 2006, Kyrgyz Republic, accessed January 29, 2007, at URL http://geo.international.gc.ca/canada-europa/kazakhstan/embassy/kyrgyz-en.asp.

Centerra Gold Inc., 2006a, History, accessed January 29, 2007, at URL http://www.centerragold.com/about/history.

Centerra Gold Inc., 2006b, Production and reserves, accessed January 29, 2007, at URL http://www.centerragold.com/properties/kumtor/production.

Centerra Gold Inc., 2006c, Reserve and resource summary, accessed January 29, 2007, at URL http://www.centerragold.com/properties/resource_summary.

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MBendi Information Services (Pty) Ltd., 2005 (January 21), Kyrgyzstan—Gold mining—Overview, accessed January 29, 2007, at URL http://www.mbendi.co.za/indy/ming/gold/as/kg/p0005.htm.
Mines & Communities, 2005, Special report—Toxic spill dispute revived in Kyrgyzstan 4th August 2005, accessed January 29, 2007, at URL http://www.minesandcommunities.org/Action/press696.htm.
Nuclear Threat Initiative, 2006 (November), Nuclear facilities—Kara Balta ore mining combine, accessed January 30, 2007, at URL http://www.nti.org/e_research/profiles/Kyrgyzstan/Nuclear/4794_4938.html.

Major Sources of Information

Kyrgyzaltyn Joint Stock Company
Ministry of Foreign Trade and Industry
National Statistical Committee of the Kyrgyz Republic

MOLDOVA

Moldova has a small mineral industry that was primarily engaged in the mining and production of industrial minerals and products, including cement, dimension stone, gypsum, limestone, and sand and gravel. The country's most significant enterprise in the mineral sector was its steel minimill. In 2005, the extractive industries, which accounted for less than 2% of the value of the country's industrial production, increased the value of their output by 14% compared with that of 2004 (Statistica Moldovei, 2005§; 2006§). The country has more than one hundred deposits of industrial minerals and small oil and gas reserves, which it hoped to develop with the aid of foreign investors (Austrian Energy Agency, 2005§).

In 2005, more than 70% of the value of the country's mineral imports came from the CIS. Moldova does not have any oil refineries and was entirely dependent on imports of petroleum products. Almost all these imports came from Romania and Ukraine although, in the 1990s, almost all came from Russia. Moldova imported all the gas it consumed from Russia (Austrian Energy Agency, 2005§).

Moldova's steel minimill in Ribnita had the capacity to produce more than 1 Mt/yr of crude steel. The country's steel mill was located in the region of Transnistria (officially, Pridnestrovie), which is a territory within the internationally recognized boundaries of the Republic of Moldova. Transnistria declared its independence as a separate Republic of the Soviet Union on September 2, 1990. Although the separatist Pridnestrovian Moldovan Republic (PMR) has exercised de facto control over most of Transnistria, its independence had not been recognized by the Government of Moldova. The steel mill was Transnistria's leading industry and accounted for about 50% of the region's budget revenues. Steel was one of Transnistria's major exports.

Outlook

The Moldova steel works increased its production capacity and was producing more than 1 Mt/yr of steel. It was the country's only major mineral industry enterprise and planned to cease operation of various production units during October 2006 to conduct technical modernization. A revamped long-products line was to be delivered toward the end of October 2006, which would enable the steel works to fulfill its production plan for 2007. The steel works had stopped some operations for several months in 2005 because of a border dispute with Ukraine, but was again exporting to CIS countries despite logistical problems involved in organizing rail shipments to and from the border post (American Metal Market, 2006§).

Internet References Cited

American Metal Market, 2006 (October 3), Moldova Steel pausing for technical upgrades, accessed January 24, 2007, at URL http://www.findarticles.com/p/articles/mi_m3MKT/is_39-2_114/ai_n16777110.
Austrian Energy Agency, 2005 (December 20), accessed January 23, 2007, at URL http://www.eva.ac.at/enercee/md/supplybycarrier.htm.
Statistica Moldovei, 2005, Cu privire la activitatea industriei Republicii Moldova in anul 2005, accessed January 23, 2007, at URL http://www.statistica.md/statistics/dat/735/ro/Industria_anul_2005.pdf.
Statistica Moldovei, 2006, Cu privire la activitatea industriei Republicii Moldova in anul 2006, accessed January 23, 2007, at URL http://www.statistica.md/statistics/dat/902/ro/Industria_anul_2006.pdf.

RUSSIA

Russia is one of the world's leading mineral producing countries and accounts for a large percentage of the CIS's production of a range of mineral products, including metals, industrial minerals, and mineral fuels. In 2005, Russia ranked among the leading world producers or was a significant producer of such mineral commodities as aluminum; arsenic; asbestos; bauxite; boron; cadmium; cement; coal; cobalt; copper; diamond; fluorspar; gold; iron ore; lime; lithium; magnesium compounds and metals; mica scrap, sheet, and flake; natural gas; nickel; nitrogen; oil shale; palladium; peat; petroleum; phosphate; pig iron; potash; rhenium; silicon, steel; sulfur; titanium sponge; tin; tungsten; and vanadium.

In 2005, the Russian economy benefited significantly from high oil, gas, and metal prices. Oil revenues accounted for about 14% of the GDP. Following the mineral fuel industry, the next leading branch of the mineral industry in terms of its contribution to the national economy was the metallurgical sector, which contributed 19% of the value of industrial production, accounted for 11.1% of the value of industrial capital stock, and employed 9.3% of the industrial labor force (Aminov, 2006). In 2005, a total of 1,071,000 people were employed in the mineral extraction sector and made up 1.6% of the country's labor force (Russian Federal Statistical Service, 2006§). Investment in mineral extraction and metallurgy accounted for about 20% of total investment in the Russian economy (table 41).

A new subsoil law remained under discussion. The current law of 1992, as amended, does not impose any special restrictions on companies with foreign participation, with the exception of diamond and radioactive materials, but this appeared likely to change to the disadvantage of foreign companies, especially those interested in investing in large or strategic deposits, such as the Udokan copper deposit or the Sukhoi Log gold deposit (Mining Journal, 2006§).

As proposed, the new mining law under discussion would include certain restrictions on foreign participation, limiting it to 49% for some commodities. This restriction would apply to deposits with large reserves of more than 150 Mt of oil,

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75 billion cubic meters of gas, 10 Mt of copper, and 700 t of gold; to strategic raw materials, which include diamond, nickel, high-purity quartz, rare earths, and uranium; and to mineral deposits located near defense and military facilities and frontier areas. Also, discussions were underway to lower the quantity of reserves from the above specified quantities for restricted deposits (Mining Journal, 2006§).

Production

In 2005, the value of mining and quarrying production, including extraction of mineral fuels, increased by 1.3% compared with that of 2004; when mineral fuels are excluded, it fell by 3.2% (Russian Federal Statistical Service, 2006§). Increases and decreases in the production of individual mineral commodities are shown in table 44. New capacity put into operation in the mineral sector is shown in table 42.

Structure of the Mineral Industry

Production in the mineral sector was highly concentrated. For more than 10 minerals, the majority of production was conducted by one company. For example, Gazprom controlled almost the entire production of natural gas in Russia, Noril'sk Nickel Mining and Metallurgical Company (MMC) produced more than 90% of Russian nickel and platinum-group metals (PGM), and ALROSA Company Ltd. produced almost all the country's diamond. The Ministry of Natural Resources reported that the copper and other mineral industries also are highly concentrated, but that the situation is better for coal and alluvial gold (table 43) (Trutnev, 2005). Despite this concentration, Russian metallurgical and mining companies were medium-sized compared with those in other countries; in the steel sector, Russian producers are generally smaller than their international counterparts. Table 45 is a list of mineral producing enterprises.

Trade

The value of mineral exports to the Russian economy has been increasing in recent years; and, in 2005, the minerals sector accounted for more than 70% of the value of exports (tables 46, 47, 48, and 49). Mineral fuels were by far the leading category of exports in terms of value. In 2005, mineral products accounted for about 12% of the total value of imports, of which metals imported from both inside and outside the CIS accounted for more than 70%.

Mineral Resources

Approximately 20,000 Russian mineral deposits have been explored, and more than one-third of these have been mined. The Ministry of Natural Resources cited serious problems in the sector, which included the depletion of reserves and the low discovery rate of new reserves (table 50). The system of reporting reserves in the Soviet Union (and which Russia very often employed for its resource reporting) was based on establishing drilling parameters to ascertain the certainty of reserves. Unlike the method used in market economy countries, this method does not include the use of market-based economic criteria to establish the feasibility of developing these resources using current technology at prevailing market conditions. Thus, reserve data based on the Soviet method cannot be compared to market economy definitions of reserves. Furthermore, Soviet data on reserves for many mineral resources was either kept secret or was difficult to obtain, and the same holds true for Russian mineral resource data. By 2005, however, Russian companies had begun to seek exposure to Western markets and stock exchanges to raise money in larger quantities and more cheaply than in Russia. A number of state secrecy laws were repealed, which has led some Russian companies to start reporting their reserves and resources according to the Australasian Joint Ore Reserves Committee (JORC) code of the Australasian Institute of Mining and Metallurgy.

Commodity Review

Metals

Aluminum.—RUSAL was Russia's leading domestic aluminum producing company and, along with SUAL, which was the second ranked domestic aluminum producer and the leading domestic bauxite producer, controlled all Russian aluminum, alumina, and bauxite production enterprises. Plans for RUSAL called for merging its resources with that of SUAL and with Swiss-based Glencore International AG to become the United Company RUSAL. This merger would start a new stage in the development of RUSAL and make it the global leader in aluminum production.

RUSAL was investing to expand and modernize its production facilities. It was engaged in commissioning the Khakas Aluminum Smelter with a capacity of 300,000 t/yr. Plans for RUSAL also called for modernizing the Sayanogorsk aluminum smelter in 2006 to increase output of aluminum and alloys and to modernize the Nikolayev Alumina refinery in Ukraine to increase output to 1.6 Mt/yr of alumina. RUSAL also planned to continue to expand production capacity at the Achinsk alumina refinery, increasing its output to 1.1 Mt/yr of alumina (RUSAL, 2007§). Included in the company's investment project portfolio is the Komi Aluminum project, which was initiated by SUAL. The project foresees the development, construction, and operation of a bauxite-alumina complex in the Komi Republic, using material from the Middle Timan bauxite deposit. The design capacity of the complex was 6 Mt/yr of bauxite and 1.4 Mt/yr of alumina. The completion of this project would considerably reduce the Russian aluminum industry's dependence on foreign countries for raw material supplies (SUAL, 2005§).

Copper.—More than 50% of Russia's copper metal production was produced by Noril'sk Nickel from ore mined by the company. The remainder came from a much smaller amount of ore mined in the Ural Mountains and a large amount of secondary material. As nickel-rich ores at Noril'sk Nickel become depleted, Noril'sk Nickel will switch to mining larger quantities of ores, which will be primarily copper-rich ores that have a higher copper content relative to their nickel content than the nickel-rich ores, but are lower in metal content for

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both metals. This change could increase copper output as Noril'sk Nickel tries to maintain its level of nickel production. Noril'sk Nickel's strategy up to 2010, however, appears to be to maintain its production of nickel-rich ores which may delay the significant increase in copper production (Humphries, 2006§).

The leading copper producer in the Ural Mountain region—the Urals Mining and Metallurgical Company (UMMC)—controls a large number of mining and metallurgical enterprises in the Urals. The company was planning to develop its raw material base and to increase its output of copper in concentrate to 105,000 t in 2010 from 72,000 t in 2003. Mine output in the Urals would also expand as mine development takes place at the Russian Copper Company Limited, which was the country's third ranked copper producer and which also controlled mining and metallurgical enterprises in the Ural Mountain region. Development of the large Udokan deposit in Chita oblast was still on hold. Reserves at Udokan and neighboring deposits were reported as ranging from 10 to more than 20 Mt of copper in ore at grades of between 0.7% and 4% copper (Helmer, 2007§; Ural Mining and Metallurgical Company, 2006§).

Gold.—Russia was having a difficult time expanding gold production because reserves at existing enterprises were being depleted and gold mining companies were experiencing greater difficulties in obtaining licenses to mine new deposits. Formerly, local Government entities could issue such licenses, but in 2005, these licenses could be obtained only through the Russian Ministry of Natural Resources based in Moscow (Kochetkov, 2005). Placers contain 18.2% of the country's reserves but they were being significantly depleted, and most existing placer mining operations were unlikely to survive beyond 2011. However, placers still contributed nearly 50% of annual production. In 2005, no new gold deposits were put into production (Mining Journal, 2006§).

More than one-half of Russia's hard rock gold resources occur in the Maiskoye, the Natalkinskoe, the Nezhdaninskoe, the Olimpiada, and the Sukhoi Log deposits in Siberia and in the Russian Far East. More than 66% of Russian gold production comes from just six eastern regions (Amur, Irkutsk, Khabarovsk, Krasnoyarsk, Magadan, and Sakha-Yakutia) (Mining Journal, 2006§). During the past 4 years, foreign companies have controlled 15% to 18% of Russian gold production, which was the largest share held for any commodity in the Russian mining industry. These foreign-held enterprises produced a total of between 30 and 36 t/yr of gold. Among Russia's leading gold producers, Bema Gold Corp., Highland Gold Mining Ltd., High River Gold Mines, Kinross Gold Corp., and Peter Hambro Mining Plc, were foreign-listed and/or foreign-controlled companies. Projects being developed by these foreign firms were expected to contribute significantly to the growth in Russian gold production in the next 5 years and could increase Russia's gold output to about 250 t/yr if they are all successfully developed. The most advanced international gold project was the Bema Gold Corp.'s development of the Kupol deposit, where production was scheduled to start in 2008 (Mining Journal, 2006§). Table 51 is a list of the leading Russian gold mining companies in 2005, which accounted for almost 70% of total production. Table 52 is a list of the leading foreign-owned gold mining companies, which accounted for about 17% of total production. The gold mining companies listed in the tables often controlled gold mines that are not listed in the tables. Significant byproduct gold was produced by mining operations of UMMC in the Ural Mountain region and Noril'sk Nickel's operations in East Siberia on the Taimyr Peninsula (165,000 ounces in 2005).

Iron and Steel.—Russia is the world's fourth-ranked steel producer after China, Japan, and the United States. Table 54 is a list of Russia's major steel mills and their ferrous metals production in 2004 and 2005. Russia shares the lead with Japan as the world's leading steel exporter. From 1998 to 2005, Russian steel production increased by more than 50%. Between 1998 and 2005, investment in the steel sector greatly increased, which improved economic indicators for steel enterprises and enabled them to improve product quality. Nevertheless, the steel sector was still in need of investment to improve its ability to compete and to expand production capacity. The process of investing in the modernization and expansion of Russian steelmaking capacity was continuing at a number of steelmaking enterprises, which included the Chelyabinsk, the Kuznetsk, the Magnitogorsk, the Nizhniy Tagil, the Novolipetsk, the Oskol, the Uralsk, the West Siberian, and other steel mills.

According to a Russian analysis, the country's steel mills can be divided into three categories based on the level of technology they employ. The mills in the first category are the country's three largest (Magnitogorsk, Severstal, and Novolipetsk), which also have the highest levels of technology. For example, this first group of mills has the lowest percentage of open-hearth production, the highest level of continuous casting, and produces the highest quality assortment of steel products. The second tier steel mills consist of the Chelyabinsk, the Nizhniy Tagil, the Kuznetsk, the Oskol, the Uralsk, and West Siberian mills. The remaining mills make up the third tier (Yuzov and others, 2006).

The trend in the Russian steel industry (as in other mineral industries) was to consolidate enterprises under the ownership of a few major firms. The country's leading steel holding company was Evraz (a Luxembourg-registered steel company) that had holdings that include three of the leading steel mills in Russia (Kuznetsk, Nizhniy Tagil, and West Siberian). Russia's third ranked steel producer, Severstal, was discussing a merger with Arcelor of Luxembourg, in part to thwart a hostile takeover bid for Arcelor by Mittal Steel of India, which was consolidating steel mills worldwide. Russian steelmakers saw the need to create a company of sufficient size and pricing power to compete with the Mittal conglomerate and also a company large enough to expand beyond Russia (Kramer, 2006§).

Iron Ore.—Russian steel companies relied on iron ore from domestic deposits. These deposits often were owned by more than one Russian steel company. In 2005, steel companies were acquiring iron ore producers to help make their companies more vertically integrated (Mining Journal, 2006§). Russia's iron ore mines and iron and steel works often were located far apart. Almost 60% of iron ore reserves are located in the Kursk magnetic anomaly (KMA) in European Russia and about 15% are located in the Ural Mountains region. Russia's major iron ore mines are listed in table 53. High-grade reserves at the open pit operations in the KMA were becoming depleted, although the area hosts significant lower grade resources in the weathered zones. These zones were estimated to contain 4 Gt of reserves

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and up to 60 Gt of potential resources, but exploiting such low-grade ores would require expensive beneficiation technology.

Iron ore output was expected to be in the range of 100 to 105 Mt/yr by 2010 (Mining Journal, 2006§). A further limited increase in iron ore production was projected to the year 2020 without a significant expansion of the resource base. The resource base for iron ore was not considered very attractive for investment because of the low grade of the ores, technological problems related to mining and processing the ores, and taxation issues (Krivtsov and others, 2005).

Nickel.—In Russia, which was the world's leading nickel producing country, more than 90% of nickel was produced by Noril'sk Nickel, which mined deposits of mixed sulfide ores mainly near Noril'sk in East Siberia, but also on the Kola Peninsula. The projected long-term ore output for Noril'sk Nickel in 2005 was raised to 22 Mt/yr. The 2005 level of production was 14 Mt of ore. With metal prices and demand at very high levels, the new higher projections were in accord with Noril'sk Nickel's marketing strategy. To maintain and increase output levels, Noril'sk Nickel was planning to switch to mining a greater proportion of cuprous and disseminated ores rather than nickel-rich ores, which were being depleted. Noril'sk Nickel also was developing new mines to replace depleted reserves of nickel-rich ore. The company's cuprous ore reserves, which are abundant, have a much lower nickel content and a somewhat lower copper content, and the disseminated ores are lower in all base-metals content than the nickel-rich ores. The nickel-rich, cuprous, and disseminated ores, however, are not greatly dissimilar in their PGM content (Kaytmazov and others, 2005; Levine and Wilburn, 2003).

The Skalisty Mine, which is located on the Taimyr Peninsula, was under development; it was expected to achieve its design capacity of 1.2 Mt/yr of nickel-rich ore in 6 to 7 years. Skalisty was scheduled to produce 310,000 t of ore in 2004. Development of the Gluboky Mine, which is located on the Taymyr Peninsula, was in the planning stage; the mine was scheduled to come onstream to mine nickel-rich ore by 2013-14. Gluboky and Skalisty would produce a combined 2 Mt/yr of nickel-rich ore (Interfax Mining and Metals Report, 2004).

Despite its development plans, obstacles were preventing Noril'sk Nickel from making major investments in developing its facilities. The investment in its nickel operations that was planned for the period up to 2010 would result in only modest increases in production, although a significant reduction in production would be averted (Humphries, 2006§).

Platinum-Group Metals.—Noril'sk Nickel's operations (located mainly on the Taymyr Peninsula) in East Siberia and also on the Kola Peninsula produce more that 90% of the country's PGM output. About 10 t/yr of PGM consisting almost entirely of platinum was mined from alluvial deposits throughout the country.

In 2004, Russia repealed the law that kept PGM production data secret and, in 2005, repealed the law that kept PGM reserve data secret. The Government published reserve figures for its major PGM holdings at the Noril'sk Nickel complex in 2005. Based on an independent audit carried out by Micon International Co. Ltd. according to the Australian Joint Ore Reserves Committee (JORC) Code, Noril'sk Nickel's reserves of combined proven and probable reserves of all six platinum group elements (iridium, osmium, palladium, platinum, rhodium and ruthenium) at Noril'sk Nickel's holdings in East Siberia as of December 31, 2004, were reported to be 81.791 million troy ounces. Proven and probable reserves were reported to be 62.183 million troy ounces of palladium and 15.993 million troy ounces of platinum with ore grades that ranged from 5.5 grams per metric ton (g/t) to 11.1 g/t. Measured and indicated mineral resources were reported to be an additional 141 million troy ounces of palladium and 40 million troy ounces of platinum. These reserves are adequate for Noril'sk Nickel to maintain current levels of palladium and platinum production for more than 20 years (Noril'sk Nickel MMC, 2005§).

Despite Noril'sk Nickel's development plan to significantly increase ore extraction, the company was proceeding more slowly than its stated plans would indicate and it appeared that through 2010, Noril'sk Nickel would try to keep output levels at about the 2005 level (Humphries, 2006§).

Industrial Minerals

Diamond.—ALROSA accounted for 97% of Russian diamond production and about 25% of world rough diamond production in 2005. Its major mining operations were located in the Sakha Yakutia Republic but, in 2005, the company began production at the Lomonosov diamond deposit in the northern European part of the country in Arkhangelsk oblast. The company had five mining and beneficiation enterprises in Sakha Yakutia—the Aikhal, the Anabar, the Mirnyy, the Nyuruba, and the Udachnyy (ALROSA Company Ltd., 2007§).

In 2005, ALROSA was able to maintain its level of mine output through its program of gradually switching to underground mining to extract low-grade diamond ore reserves. ALROSA had started underground operations at the No. 7/8 Block of the Internatsiolnal'nyy underground mine and was continuing construction of underground mining at the Mir and the Udachny Mines. To maintain stable operations, ALROSA would need to increase its ore reserves by carrying out intensive prospecting for new diamond deposits. The company planned to increase its investment in exploration significantly. A new Mirny Exploration Expedition was established to concentrate on exploration (ALROSA Company Ltd., 2006§).

On June 28, 2005, full-scale mining was initiated at ALROSA's Lomonosov Division OAO Severalamz in the Arkhangelsk region with the commissioning of ore treatment plant No. 1 at the Lomonosov deposit. The plant was designed with the capacity to process about 1 Mt/yr of ore. Diamonds from the deposit are of gem quality, which accounted for the high appraisal value of the reserves at $12 billion. The diamond deposit's effective life was estimated to be about 50 years from the time the plant was put into operation (ALROSA Company Ltd., 2005§).

Phosphate Rock.—The OJSC Apatit enterprise, which is located on the Kola Peninsula, was the leading producer of apatite concentrate in Russia and one of the world's leading suppliers of phosphate raw material; its core activities were the mining and beneficiation of apatite and nepheline-syenite ores at 10 deposits that have estimated combined reserves of

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3.5 Gt. The development plan for Apatit to 2015 assumes an optimal level of apatite concentrate production of 8.5 Mt/yr that would require levels of ore extraction of 27 to 28 Mt/yr (GD Associates Oy, 2004§). To maintain output, the enterprise would need to develop underground mining significantly. In 2001, the percentage of ore mined underground was 38%; by 2015, this percentage was expected to increase to 75%. Investment to renovate the beneficiation complex, reduce energy expenditures, reduce emissions harmful to the environment, and acquire new equipment to improve labor productivity was also needed.

Mineral Fuels and Related Materials

Projections of Russia's fuel production are based on the country's Energy Strategy for Russia for the Period up to 2020 issued in 2003 by the Ministry of Energy of the Russian Federation. This strategy envisions three potential scenarios: optimistic, moderate, and critical. The optimistic scenario is characterized by the growth of GDP at the rate of 4.7% to 5.2% annually, by a sevenfold increase of investment in fixed capital for this period compared with the 2000 level, and by high world prices for oil and gas. The oil prices envisioned by this strategy in 2003, even for the optimistic scenario, were about one-half of the 2005 oil prices. The moderate scenario is characterized by a GDP growth of 3.3% to 3.4% annually to 2020, an increase of investment in fixed capital by 3.6 times, and fixed prices for oil at a little more than one-half of the optimistic scenario and gas prices about 20% lower than in the optimistic scenario. The critical scenario is characterized primarily by low world oil prices (Ministry of Energy of the Russian Federation, 2003§; Mastepanov, 2006§).

Coal.—The Energy Strategy for Russia for the Period up to 2020 foresees the need for coal production to increase to between 310 and 330 Mt by 2010 and to between 375 and 430 Mt by 2020 to meet expected domestic demand. Russia has 22 coal basins with 114 coal deposits that are unevenly distributed across the country. In 2005, the country had 241 operating coal mines, which included 104 underground mines and 137 open pits with a total production capacity of 315 Mt/yr. Total coal reserves registered in the State Register of Reserves were estimated to be about 200 Gt, and registered reserves in the explored categories $A+B+C_1$ in the reserve classification system that was used in the Soviet Union and later Russia were reported as 106 Gt. These include coal reserves in operating coal mines, in mines under construction, and in areas explored in detail for new mine construction. As foreseen in the country's energy strategy program, coal production must increase by 10 to 15 Mt/yr between 2005 and 2010 and by a total of 105 Mt by the year 2020. Although the creation of additional coal production capacity through upgrading and expansion of existing mines and development of new mines was possible based on reserves, doing so would require a level of investment in the coal sector far in excess of the historic level of investment in the past 5 years and casts doubt on the feasibility of the planned expansion. At current rates of investment coal production capacity by the year 2020 would be in the neighborhood of 375 Mt/yr. This optimistic investment scenario would depend to a large extent on an increase in foreign investment, particularly from Chinese, Japanese, and South Korean companies (Voskoboynik, 2006).

Natural Gas.—The country's energy strategy predicts natural gas production to range between 635 to 665 billion cubic meters in 2010 and between 680 and 730 billion cubic meters in 2020 (Ministry of Energy of the Russian Federation, 2003§). These gas production goals were to be achieved by development in the traditional gas-producing regions, the main one of which was West Siberia, and in the new oil- and gas-producing provinces in East Siberia, in the Russian Far East, in the European North including offshore in the Arctic Sea, and on the Yamal Peninsula. Along with the development of big fields, the strategy recommends development of small gasfields, primarily in the European part of the country in the Ural Mountains, the Volga, and the North West regions.

Almost all the country's gas production was under the control of the company Gazprom. Gazprom's natural gas production forecast called for only modest production growth of about 1.3% by 2008. Growth in Russia's natural gas sector has been slowed primarily by aging fields, state regulation, Gazprom's monopolistic control over the industry, and insufficient export pipelines. Three major fields in Western Siberia—Medvezh'ye, Urengoy, and Yamburg—accounted for more than 70% of Gazprom's total natural gas production, but these fields were in decline. Although Gazprom projected increases in its natural gas output between 2008 and 2030, most of Russia's natural gas production growth was expected to come from independent gas companies, such as Itera, Northgaz, and Novatek (U.S. Energy Information Administration, 2007a§).

Reassessment of the energy strategy has been ongoing since the strategy was issued in 2003. A Gazprom subsidiary issued a report recommending a change of export strategy for the Russian gas industry. It determined that Russia should decrease exports of natural gas to European markets and concentrate instead on developing new gasfields to keep up with domestic demand, which was rising faster than was envisioned in the 2003 report and could necessitate the development of new gasfields on the Yamal Peninsula and in other places (Radio Free Europe Radio Liberty, 2006§).

Petroleum.—The Energy Strategy for Russia for the Period up to 2020 includes several scenarios that predict a range for Russian oil production of between 445 and 490 Mt/yr by 2010 and between 450 and 520 Mt/yr in 2020 (Ministry of Energy of the Russian Federation, 2003§). Oil production and growth was to be centered in the traditional oil-producing regions, such as in West Siberia, the North Caucasus, and the Volga region and in new oil and gas Provinces in the European North (Timan-Pechora region), in eastern Siberia and the Russian Far East, and in the south in the North Caspian region. Although the base of the country's oil production for this period would remain the West Siberian oil and gas province, priority areas for new development were to be in the eastern and the southern regions of the country. New field developments were likely to produce almost all Russia's annual oil growth in the next 5 years and would likely produce more than one-half of the country's oil in 2020. In the next 5 years, new field developments at the Middle Caspian project at Kurmangazy (OAO Lukoil Oil Co.); the Komsomolskoye and the Vankorskoye projects (OAO

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Rosneft Oil Co.); the Prirazlomnoye project (OAO Rosneft Oil Co. and OAO Gazprom); the Sakhalin Island projects; the West Salymskoye project (Shell Joint Venture); and the Timan Pechora project (OAO Lukoil Oil Co. and ConocoPhillips) would help compensate for production decreases at older fields (U.S. Energy Information Administration, 2007b§).

Uranium.—Uranium mining in Russia was conducted entirely by the corporation JSC TVEL's ore mining enterprises, and in particular by open pit mining at its subsidiary JSC Priargunsky Industrial Mining & Chemical Union and also by in situ underground leaching at its subsidiaries CJSC Dalur in the Kurgan region and JSC Khiagda in Buryatia. Annual uranium production was about 3,400 t, of which more than 90% was produced by Priargunsky. Uranium-bearing ores and solutions were processed to generate uranium concentrates, which were shipped for further reprocessing at the JSC Chepetsky Mechanical Plant.

The country's annual natural uranium consumption amounted to approximately 9,000 t. According to projections, the demands for uranium by the nuclear industry in Russia will grow by 1.7 times. The "TVEL Uranium" program was launched by TVEL Corporation to further develop uranium production up to 2010; an increase in ore mining to 4,300 t of uranium in 2010 was envisioned. Mining was being developed at the JSC Dalur enterprise in the Kurgan region, which produced about 200 t of uranium in 2005. The enterprise planned to increase production by 15% to 20% annually to produce 1,000 t by 2010 (TVEL Corporation, 2005a§). The construction of mine No. 6 at the Priargunsky deposit had been started to increase ore production (TVEL Corporation, 2005b§).

The JSC Khiagda enterprise was developing a pilot mining operation to mine the Khiagdinskoye deposit in Buryatiya using underground well leaching. Khiagda commenced commercial operations in 2005 and Khiagda planned to have the capacity to produce 1,000 t/yr of uranium by 2012. Total reserves at the JSC Khiagda site reportedly amount to 100,000 t of uranium (TVEL Corporation, 2005c§).

Outlook

The Russian Ministry of Natural Resources has developed a draft of a long-term program "On the Exploration and Prospecting of Subsoil Reserves and Reproduction of the Mineral Resource Base for a Period until 2020," but despite this draft, Russia appears to have no clear strategy for developing its mineral resources. Rather, the country is intensively extracting its fuel and nonfuel mineral reserves, which is leading to the depletion of the majority of these reserves before the year 2020, if not much sooner.

In 2004 and 2005, Russian steel companies presented initial public offerings (IPOs) in the Western markets. This trend of presenting IPOs is set to continue in other sectors of the mineral industry. Consolidation of assets is also a recent trend, which is evident with the creation of Russia's leading aluminum producer, United Company RUSAL, through such consolidation.

There is also a trend to internationalize Russia's mineral enterprises. Russian companies, such as ALROSA, Noril'sk Nickel, and RUSAL, are acquiring major foreign assets. Many of Russia's leading companies aspire to become major international players. Although Severstal's bid for Arcelor (which would have created the world's largest steel company) appears to have failed, it is unlikely to be the last such bid from a Russian corporation.

References Cited

Aminov, Aleksandr, 2006, Sotsial'nye investitsii (Social investments): Stal' (Steel), no. 2, p. 63-67

Interfax Mining and Metals Report, 2004, Noril'sk Nickel's Skalisty Mine to quadruple output in 6-7 yrs: Interfax Mining and Metals Report, issue 27, July 2-8, p. 20.

Kaytmazov, N.T., Shur, M.B., Naftal', M.N., Rylev, E.A., and Tsemekhman, L.S., 2005, Zaporyarnyy gigant "Noril'skogo Nikelya": Osnovnye napravleniya i perspektivy proizvodstvenno-tekhnicheskogo razvitiya [Trans-Polar giant "Noril'sk Nickel": Main directions and perspectives for production and technical development (Nonferrous Metals)], no. 10, p. 17-21.

Kochetkov, Anatoly, 2005, Gold production is restrained by shortages of gold reserves: Eurasian Metals, no. 2, p. 45-49.

Krivtsov, A.I., Benevol'skiy, B.I., and Migachev, I.F., 2005, Sbalanansirovannoye ispol'zovaniye I vosproizvodstvo mineral'no-syr'yevoy bazy Rossii v dolgosrochnoy perspektive [Sustainable use and enlargement of Russia's mineral-raw material base in the long term perspective]: Rudy I Metally [Ores and Metals], no. 1, p. 32-28.

Levine, Richard, and Wilburn, David, 2003, Russian PGM—Resources for 100+ years, U.S. Geological Survey Open-File Report 03-059.

Trutnev, Y.P., 2005, O dolgosrochnoy gosudarstvennoy programme izucheniya nedr I vosproisvodstva mineral'no-syr'yevoy bazy Rossii na osnove balansa potrebleniya I vosproizvodstva mineral'nogo sy'ya (2005-2010 i do 2020 g) [Concerning the long term Government program for studying the earth and expanding Russia's mineral raw material base on the basis of balancing demand and expanding mineral raw material (2005-2010 and to 2020)]: Rudy i Metally [Ores and Metals], no. 1, p. 5-12.

Voskoboynik, M.P., 2006, Challenges of coal industry development in Russia: Russian Mining, no. 4, p. 5-9.

Yuzov, O.V., Sedykh, A.M., and Afonin, S.Z., 2006, Ekonomicheskie pokazateli i problemy razvitiya chernoy metallurgii Rossiii [Economic indicators and development problems of Russian ferrous metallurgy]: Chennaya Metallurgiya [Ferrous Metallurgy], no. 4, p. 3-12.

Internet References Cited

ALROSA Company Ltd., 2005 (June 29), Ore treatment plant N1 of Lomonosov diamond deposit was put into operation, News Release, accessed February 21, 2007, at URL http://eng.alrosa.ru/news/index.php?ID=44.

ALROSA Company Ltd., 2006, Annual report for 2005, accessed February 21, 2007, at URL http://eng.alrosa.ru/reports.

ALROSA Company Ltd., 2007, accessed February 21, 2007, at URL http://eng.alrosa.ru.

GD Associates Oy, 2004 (June 15), Analysis of opportunities for introduction of environmental management systems at Murmansk region companies, accessed February 21, 2007, at URL http://www.environment.fi/download.asp?contentid=22639&lan=fi.

Helmer, John, 2007 (March 13), Mineweb, Makhmudov group loses position on massive Udokam copper deposit, accessed October 3, 2007, at URL http://www.mineweb.com.mineweb/view/mineweb/en/page36?oid=16105&sn=Detail.

Humphries, David, 2006 (September), An industry in transition, accessed February 12, 2007, at URL http://nornik.ru/en/investor/presentations/136.

Kramer, Andrew, 2006 (July 13), Russia building steam as steel producer, accessed March 2, 2007, at URL http://www.iht.com/articles/2006/06/19/business/steel.php.

Mastepanov, A.M., 2006, Energy strategy to 2020, accessed February 14, 2007, at URL http://ec.europa.eu/energy/russia/presentations/doc/energy-strategy2020_en.pdf.

Mining Journal, 2006, Countries and commodities reports—Russia, accessed March 13, 2007, at URL http://www.mining-journal.com/registered/Annual_Review_Article.aspx?articleid=7317.

Digitized by Google

Ministry of Energy of the Russian Federation, 2003, The summary of the energy strategy of Russia for the period up to 2020, accessed February 14, 2007, at URL http://www.ec.europa/eu/energy/russia/events/doc/2003_strategy_2020_en.pdf.
Noril'sk Nickel MMC, 2005, Annual report, accessed March 3, 2007, at URL http://www.nornik.ru/en/investor/report/annual.
Radio Free Europe Radio Liberty, 2006 (July 21), Russia, A new gas strategy emerges, accessed February 14, 2007, at URL http://www.rferl.org/featuresarticle/2006/07/66ca005e-f818-4f4a-a9f8-bdc3cf080413.html.
Russian Federal Statistical Service, 2006, Rossiya v Tsifrakh 2006 [Russia in figures 2006], accessed March 7, 2007, at URL http://www.udbstat.eastview.com/catalog/readbook.jsp?issue=501390.
RUSAL, 2007 (January 30), RUSAL announces 2006 results, accessed February 12, 2007, at URL http://www.rusal.com/press/issues/?ID=32595.
SUAL, 2005, About SUAL, accessed February 12, 2007, at URL http://www.sual.com/company.
TVEL Corporation, 2005a, CJSC Dalur, accessed March 3, 2007, at URL http://www.tvel.ru/en/corporations_enterprises/mineral_mining_enterprises/dalur.
TVEL Corporation, 2005b, Geological survey and uranium mining, accessed March 3, 2007, at URL http://www.tvel.ru/en/business_activities/geological_survey_uranium_mining.
TVEL Corporation, 2005c, JSC Khiagda, accessed March 3, 2007, at URL http://www.tvel.ru/en/corporations_enterprises/mineral_mining_enterprises/khiagda.
Ural Mining and Metallurgical Company, 2006, Projects, accessed February 12, 2007, at URL http://ugmk.com/en/company/projects.
U.S. Energy Information Administration, 2007a (April), Russia—Natural gas, accessed October 10, 2007, at URL http://www.eia.doe.gov/emeu/cabs/Russia/NaturalGas.html.
U.S. Energy Information Administration, 2007b (April), Russia—Oil, accessed October 10, 2007, at URL http://www.eia.doe.gov/emeu/cabs/Russia/Oil.html.

Major Sources of Information

Federal Service for Ecological, Technological, and Atomic Oversight
Federal State Statistics Service
Ministry of Atomic Energy
Ministry of Industry and Energy
Ministry of Natural Resources

TAJIKISTAN

Tajikistan's major mineral-producing enterprise was the Tajik Aluminum smelter (TadAz) in Tursunzade (formerly Regar), which had a design capacity to produce 517,000 t/yr of aluminum. Tajikistan's mineral industry at one time mined or produced aluminum, antimony, arsenic, boron, celestite, cement, coal, construction materials, fluorspar, gold, lead and zinc, mercury, molybdenum, natural gas, petroleum, salt, semiprecious and decorative stones, silver, strontium, tin, tungsten, and uranium.

Only a few primarily nonprecious metal mining production enterprises were still operating in 2005. These included the Anzob mining and beneficiation complex, which mined reserves of the Dzhidzhikrutskoye antimony-mercury deposit and supplied metallurgical enterprises in Kyrgyzstan; the Altyn-Topkan mining directorate; and the Adrasman mining and beneficiation complex, which developed copper-bismuth and lead-silver ores. The main output of Adrasman included concentrate with a lead content of 43% and a silver content of 5,943 g/t.

Adrasman also had been producing concentrates for the production of bismuth, copper, fluorspar, gold, zinc, and—the most valuable component of the ore mined by Adrasman—silver. Gold mining had begun during the Soviet period and a number of foreign firms were engaged in developing the country's gold reserves. By 2001, the country was able to almost completely satisfy its own salt requirements through development of the large Kamysh-Kurganskoye and Khodzha-Muminskoye deposits.

The country's fuel requirements had been met almost completely through imports of oil products and coal from other CIS countries. In 2005, the extraction of coal was below 50,000 t/yr compared with its previous peak of more than 800,000 t/yr, and plans called for reviving and expanding coal production.

The metallurgical sector produced about 45% of the value of industrial production and was composed solely of the Tajik aluminum plant. The construction materials sector produced less that 2% of the value of industrial production, and the fuel and energy sector produced more than 5% (State Statistical Committee of Tajikistan, 2005, p. 188).

Trade

In 2004 (the latest year for which trade data were available), nonprecious metals accounted for 62.2% of the total value of exports, and other mineral products, 7% (State Statistical Committee of Tajikistan, 2005, p. 268). The Tajik aluminum plant was the country's main export earner; it provided more than 50% of the country's export earnings. To supply its aluminum plant with alumina, Tajikistan imported almost equal amounts of alumina from inside and outside of the CIS. Its main supplier in the CIS was Azerbaijan, which supplied more than twice the amount of each of the next-ranked suppliers, which were, in order of amount supplied, Russia, Ukraine, and Kazakhstan. For other imported mineral products, Uzbekistan supplied portland cement and nitrogenous fertilizers and Kazakhstan supplied phosphate fertilizers. The country imported natural gas from Uzbekistan and oil products mainly from Turkmenistan, but also much smaller amounts from, in order of amount supplied, Kazakhstan, Russia, and Uzbekistan (State Statistical Committee of Tajikistan, 2005, p. 272-275).

Mineral Resources

Tajikistan has what are termed, according to the reserve classification system that was used in the Soviet Union, industrial reserves of metals, which include bismuth, cadmium, copper, gallium, germanium, indium, tellurium, thallium, selenium, and others. In its reserves of antimony, boron, lead, silver, and zinc, Tajikistan had occupied a leading place among the Republics of the Soviet Union. The Bol'shoy Konimansur deposit, which had undergone detailed exploration, but had not been developed, was reportedly the largest polymetallic silver porphyry deposit in the Soviet Union. The country's largest gold deposits are located in the Zeravshan Valley.

In 2005, more than 400 mineral deposits had been discovered and explored. According to information from the Academy of Sciences of the Republic of Tajikistan, 28 gold deposits

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had been identified with a total estimated resource of almost 430 t of gold. The Bol'shoy Konimansur deposit in the north of Tajikistan was reportedly the world's second largest deposit of silver. At an annual extraction rate of 50 t/yr of silver, the deposit would have the potential to sustain production for 150 years. The country's antimony resources are reportedly the largest in the CIS. The Sughd region has antimony and mercury resources, as well as 214 deposits of other mineral resources, which include bismuth (3 deposits), coal (11 deposits), copper, fluorspar (5 deposits), gold (15 deposits), iron (3 deposits), lead (1 deposit), molybdenum, oil and gas (11 deposits), salt (1 deposit), silver (7 deposits), strontium (2 deposits), tungsten (1 deposit), and zinc (16 deposits). In the north of Tajikistan, numerous deposits of construction and decorative materials, such as marble, granite, volcanic tuff, and limestone, occur. In central Tajikistan, the Maikhura tungsten deposit was discovered approximately 95 kilometers (km) from Dushanbe. The Republic's only known deposit of boron is located at Ak-Arkhar (Tajikistan Development Gateway, 2007§).

Outlook

Tajikistan plans to expand aluminum production. In 2004, Russia's leading aluminum producer, RUSAL, signed an agreement with the Tajikistan Government on cooperation in energy and aluminum production. RUSAL planned to invest more than $1 billion in Tajikistan by participating in the construction of a hydroelectric powerplant, building a new 200,000-t/yr aluminum smelter, and modernizing and adding 100,000 t/yr of additional capacity to the existing smelter (Socor, 2004§). Uzbekistan expressed opposition to RUSAL's plans to expand aluminum production at the existing smelter, complaining that effluvia generated by the Tajik plant was causing widespread environmental damage to Uzbekistan's agricultural lands (Sadikov, 2006§). Furthermore, as of January 2007, Tajikistan officials were expressing concern that RUSAL was not proceeding to fulfill its commitments to construct these projects and that work had still not begun on either the modernization of the existing smelter or construction of the new smelter, although work on the hydropower plant was underway without RUSAL's participation. At the time of the writing of this report (January 2007) RUSAL stated that it was still prepared to fulfill its commitments for these projects (Avesta Tajikistan News, 2007§).

Reference Cited

State Statistical Committee of Tajikistan, 2005, Yezhegodnik Respubliki Tadzhikistan [Statistical yearbook of Tajikistan]: Dushanbe, Tajikistan, State Statistical Committee of Tajikistan, p. 188.

Internet References Cited

Avesta Tajikistan News, 2007 (January 27), Minister Gulov asks Rusal to fulfill promises, accessed January 27, 2007, at URL http://www.avesta.tj/en/articles/38/78705.html.

Sadikov, Alexander, 2006 (April), Tajikistan's ambitious energy projects cause tensions with Uzbekistan, accessed January 26, 2007, at URL http://www.eurasianet.org/departments/insight/articles/eav100406.shtml.

Socor, Vladimir, 2004 (October 20), Russia taking over Tajikistan's main economic entities, accessed January 26, 2007, at URL http://www.jamestown.org/edm/email-to-friend.php?article_id=2368716.

Tajikistan Development Gateway, 2007, Mineral resources, accessed January 25, 2007, at URL http://www.tajik-gateway.org/index.phtml?lang=en&id=163.

Major Sources of Information

Ministry of Economy and Trade
Ministry of Nature Protection
State Statistical Committee

TURKMENISTAN

Although Turkmenistan produces a wide range of industrial minerals, its major mineral resources are its oil and gas reserves; the country is a leading regional natural gas producer. Turkmenistan has several of the world's largest gasfields, which include the Dauletabad, which was brought into production in 1982, and the Shatlykskiye, which was brought into production in the early 1970s (U.S. Energy Information Administration, 2005§). Turkmenistan has oil refineries at Seydi and Turkmenbashy.

The country's leading nonfuel mineral enterprises were the Arpaklenskiy barite-witherite and the Cheleken ozokerite enterprises, the Gaurdak sulfur plant, the Karabogazsulfate association, the Kara-Kum sulfur plant, and the Oglanly bentonite mining enterprises. One of the leading enterprises that extracted chemical raw materials was the Karabogazsulfate association, which mined the Kara-Bogaz Gol lagoon off the Caspian Sea. The association produced bischofite, Caspian Sea salt, epsomite, Galauber's salt, and sodium sulfate. In the western part of the country, the Boyadagskoye, the Cheleken, and the Nebitdag deposits of iodine-bromine waters were being developed; the waters were processed at the Cheleken and the Nebitdag iodine/bromine plants.

All mineral production enterprises were state owned and all deposits were being developed by enterprises subordinate to the state and its ministries. The state permitted foreign participation through joint-venture arrangements.

Trade

Exports of natural gas and oil and oil products accounted for about 80% of Turkmenistan's merchandise exports, and the country has benefited from the recent high world market prices for oil. The Central Asia pipeline, which is routed into the Russian natural gas pipeline system, was the region's only main gas pipeline. More than 90% of Turkmenistan's natural gas exports were transported via the eastern branch of the Central Asia pipeline. For 2005 and 2006, Turkmenistan negotiated improved payment terms for its natural gas exports with Russia and Ukraine, which included the elimination of barter settlements and an almost 50% increase in the export price. A 25-year natural gas export agreement signed with Russia in 2003 could help maintain a steady stream of foreign exchange inflows. However, the limited capacity of the existing natural gas pipelines and lack of alternative natural gas export routes

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constrains the country's natural gas export potential and makes exports vulnerable to disruptions (World Bank, The, 2006§). A small portion of the country's gas exports go to Iran via the Korpedzhe to Kurt-Kui pipeline, which was completed in December 1997 (Olcott, 2004§).

Mineral Resources

Turkmenistan has a variety of unevenly distributed mineral deposits. More than 80% of the country's territory is composed of the Kara-Kum desert. According to estimates by the Oil & Gas Journal, Turkmenistan ranked fifteenth in the world in the quantity of its natural gas reserves, which were estimated to be 71 trillion cubic feet (about 2 trillion cubic meters) (U.S. Energy Information Administration, 2005§). The largest natural gas fields are located in the Amu-Dar'ya Basin, and possibly one-half of the country's natural gas reserves are located in the giant Dauletabad-Donmez field. In addition to Amu-Dar'ya, Turkmenistan contains large natural gas reserves in the Murgab Basin, particularly the giant Yashlar deposit, which contains an estimated 27 trillion cubic feet of gas (Republic of Turkmenistan, undated§).

Turkmenistan reportedly has 546 Mbbl of proven oil reserves, with possible reserves (mainly in the western part of the country and in undeveloped offshore areas in the Caspian Sea) of up to 1.7 Gbbl (Republic of Turkmenistan, undated§). As of 2001, Turkmenistan had an inventory of 162 nonfuel mineral deposits with confirmed reserves; these deposits included 10 deposits of mineral salts (7 of sodium and 3 of potash), 7 of barite, 3 of coal, 2 of carbonate material for soda production, 2 of celestite, 2 of kaolin, 2 of marble onyx, 2 of natural sulfur, 2 of ozokerite, 1 of bentonite, 1 of natural pigments, and 128 of various construction materials (which included 7 of dimension stone, 5 of filing stone, 3 of cement raw materials, 3 of glass raw materials, and 3 of gypsum). Of these deposits, 62 were under development.

Outlook

Turkmenistan could increase its natural gas production if pipeline capacity is increased. A number of new pipelines that originate in Central Asia are under consideration, including a proposed Trans-Afghan pipeline to export Central Asian natural gas via Afghanistan to Pakistan (U.S. Energy Information Administration, 2005§).

In the spring of 2006, Turkmenistan's President signed an agreement with China to build an export pipeline eastward to export Turkmenistan's gas. According to the agreement, in the first phase of the project (starting in 2008), Turkmenistan was to deliver about 30 billion cubic meters per year of gas via Uzbekistan and Kazakhstan to Urumci in western China and beyond to Shanghai; these volumes were to be increased to up to 50 billion cubic meters per year by 2010. Experts have cast doubt on the project's feasibility for a number of reasons, including a lack of details about the financing and construction (Kimmage, 2006§). According to a 10-year program initiated in 2000, Turkmenistan plans to raise its oil production to nearly 1 Mbbl/d (or by almost 50 Mt/yr) by 2010 (Republic of Turkmenistan, undated).

Internet References Cited

Kimmage, Daniel, 2006 (April 10), Central Asia: Turkmenistan–China pipeline project has far reaching implications, Radio Free Europe/Radio Liberty, accessed February 1, 2007, at URL http://www.rferl.org/featuresarticle/2006/04/55f9574d-407a-4777-9724-944e6c2ecd7b.html.

Olcott, M.B., 2004 (May), International gas trade in Central Asia, Turkmenistan, Iran, Russia, and Afghanistan, accessed February 1, 2007, at URL http://iis-db.stanford.edu/pubs/20605/Turkmenistan_final.pdf.

Republic of Turkmenistan, [undated], accessed February 2, 2007, at URL http://unece.org/operact/opera/sppled/tur.htm.

U.S. Energy Information Administration, 2005, Central Asia, accessed February 1, 2007, at URL http://www.eia.doe.gov/emeu/cabs/Centasia/NaturalGas.html.

World Bank, The, 2006, Turkmenistan, Country Brief, accessed February 1, 2007, at URL http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/ECAEXT/TURKMENISTANEXTN/0,,menuPK:300741~pagePK:141159~piPK:141110~theSitePK:300736,00.html.

Major Sources of Information

Ministry of Building Materials Industry
Ministry of Energy and Industry
Ministry of Oil and Gas and Mineral Resources

UKRAINE

Ukraine was a major world producer of coal, ferroalloys, ilmenite, iron ore, manganese ore, and steel. The country's steel exports were of major importance on world markets. Other major mineral commodity exports were iron ore and ferroalloys.

Ukraine was a lesser producer of a number of other metallic mineral products, which included alumina, aluminum, cadmium, germanium, secondary lead, magnesium, mercury, nickel, rutile, uranium ore, secondary zinc, zircon, zirconium, and a large number of industrial minerals, which included dolomite, graphite, kaolin, limestone fluxes, potash, quartz, salt, soda ash, and a variety of building materials. Ukraine is one of the world's leading energy transit countries. Its large oil and gas pipeline networks transport Russian and Caspian Sea oil and gas across its territory.

In a study conducted by the Institute of Economics, the Ukrainian Academy of Sciences, and other experts, production from mineral raw materials accounted for 40% of Ukraine's GDP in 2000, and about 60% of the country's budget revenues (Gurskiy and Kalinin, 2005). Despite the significance of mineral raw materials to the country's economy, Government support for the geological sector has greatly decreased since the dissolution of the Soviet Union. At the time of the breakup, 41 geological organizations that employed 58,760 persons were state supported; by 2003, the number of state-supported organizations had decreased to 11 and the number of workers to 9,839. The level of Government funding for geologic work had been reduced by more than 70%. Owing to the lack of financial support, the country was experiencing a shortage of needed specialists and was lacking up-to-date technology and equipment (Gurskiy and Kalinin, 2005).

Ukraine established a Ministry of the Environment and introduced a pollution fee system that levies taxes on air and water emissions and solid waste disposal. The revenues obtained are used for environmental protection activities. Enforcement of

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this pollution fee system, however, was lax (U.S. Department of State, 2006§).

Production

In 2005, the extractive industries experienced a 4.4% growth in the value of output compared with that of 2004 as output rose by 6.2% for mining metallic ore, by 3% for coal and peat extraction, and by 2.5% for oil and gas production. Ukraine, however, experienced a reduction in the value of output in the coke, metallurgical, and oil-refining sectors. In the metallurgical sector, the value of output decreased by 0.2% compared with that of 2004 (Interfax Statistical Report, 2005). The production of specific major mineral commodities in 2005 showed mixed results, with production increasing for iron ore and titanium sponge but decreasing for crude steel and coal (table 59). Production data for ferrous metals at Ukrainian mines and metallurgical plants are provided in tables 60, 61, 62.

Explored iron ore reserves in Ukraine were reportedly 32.2 Gt, which placed it among the leading countries of the world. The iron ore deposits that were in production have been intensively developed for a long period of time and reserves were being depleted, particularly the high-grade ores that could be easily extracted. In 2005, seven iron ore mining enterprises were extracting ore from 11 open pits and four enterprises were mining at 8 underground mines. Reserves were considered adequate to maintain current levels of output at open pits for 36 to 95 years and at underground mines for 9 to 50 years. Iron ore mining contributed about 3% of the GDP (Kolosov, and Dyadechkin, 2005).

Structure of the Mineral Industry

In 2005, Ukraine's mineral sector consisted of about 365 enterprises, which included 3 ferroalloy plants, 7 pipe production plants, 14 ferrous metals plants, 16 coke chemical plants, 17 refractories plants, 26 nonferrous metals enterprises, 26 ore mining enterprises, and 35 enterprises that produced secondary ferrous and nonferrous metals (table 63). The nonferrous sector includes ore mining and metal production of such commodities as alumina, aluminum, antimony, hard alloys, lead, magnesium, mercury, rare metals, semiconductor materials, silicon, titanium, and zinc (Embassy of Ukraine in Japan, 2002§).

Ukraine reportedly ranks second in the world in manganese reserves, which were estimated to be 2.3 Gt. However, commercial reserves at operating enterprises were reportedly 200 Mt, of which only 15% were of the higher grade oxide ores. The majority of the manganese ore has a high phosphorus content. Two mining and beneficiation complexes mined manganese ore from nine open pits and five underground mines (Kolosov and Dyadechkin, 2005).

Trade

In 2005, Ukraine's main mineral product exports were iron ore and steel products. Ukraine increased exports of iron ore by 8.5% but reduced the amount of rolled-steel exports by 3.8% compared with that of 2004. Its main mineral imports in terms of value were oil and natural gas from Russia and Turkmenistan (tables 64 and 65).

Almost all Ukraine's iron ore exports went outside the CIS to the formerly centrally planned economy countries of eastern Europe, with a small amount going to Russia (Interfax Mining and Metals Report, 2006a, d). Ukrainian steel exports went to countries outside the CIS, which included China, countries in the EU, and the United States (Interfax Mining and Metals Report, 2006b, c).

Mineral Resources

Ukraine holds a leading place among the countries of the CIS, Europe, and the world in the quantity of some of its mineral resources. The Donets Basin, where coal has been mined since 1795, is the main source of coal in Ukraine. This Basin, which is located in the Donetsk and the Luhansk oblasts, extends farther east to Rostov oblast in Russia. With a total area of approximately 60 thousand square kilometers, the Basin's coal resources are estimated to be 109 Gt. Other major deposits include iron ores in the Kryvyi Rih Basin (estimated resources of 18.7 Gt), and the Kremenchuh (4.5 Gt), the Bilozersk (2.5 Gt) and the Kerch (1.8 Gt) iron ore basins. Ukraine's manganese ore fields in the Nikopol Basin are some of the largest in the world. The majority of the manganese ore has a high phosphorus content (Kolosov and Dyadechkin, 2005).

Ukraine also has substantial deposits of other metallic ores, including mercury, nickel, and titanium and nonmetallic ores, including potash, rock salt, and sulfur. Its graphite resources are the largest on the European continent. The country also has uranium deposits from which it planned to increase production in the future (Ukraine Ministry of Foreign Affairs, 2006§).

Outlook

In 2005, Ukraine's metallurgical industry was working at a high rate of capacity utilization, with pig iron production capacity being utilized at 86.5% and steelmaking capacity, at 94.3%, which does not leave extensive room for growth unless new capacity is added (Internet-Gazeta, 2007§). Ukraine's steel industry, which experienced continuous growth from 1999 to 2004, decreased production in 2005 owing to unfavorable market conditions referred to as the "China factor." While high demand from China had been stimulating growth in Ukraine's steel industry, in 2005, China switched from being a net importer to a net exporter of steel, which not only closed the Chinese markets to Ukraine, but also curtailed Ukraine's exports to other countries of Southeast Asia. To remain competitive on the world steel market, Ukraine must invest in state-of-the-art equipment to produce steel of the same quality and at the same cost as other leading world steel-producing countries (Kisil' and others, 2006).

Despite the country's reporting large quantities of iron ore and manganese reserves based on the reserve reporting system of the Soviet Union, a large portion of these "reserves" are not economically exploitable and therefore would not qualify as reserves by market economy standards for defining reserves.

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For example, of the 17.7 Gt of iron ore listed as "economic reserves" at existing enterprises under the Soviet reserve reporting system, only 7.71 Gt were considered suitable for commercial extraction, of which 450 Mt were of rich ores with an iron content of between 54% to 62%, and the remainder was low-grade ore with an iron content of between 24% to 30%. Furthermore, mining conditions were worsening with the increasing depth of open pits and underground mines. Depths at some open pits have reached 350 m and, at some underground mines, between 1,400 and 1,500 m (Kolosov and Dyadechkin, 2005).

References Cited

Gurskiy, D.S., and Kalinin, V.I., 2005, Mesto I rol' geologicheskoy sluzhby Ukrainy v sisteme nedropol'zovaniiya [The place and role of the Ukrainian Geological Service in the system of using the earth's resources]: Gornyy Zhurnal [Mining Journal], no. 5, p. 4-9.

Interfax Statistical Report, 2005, Industrial production in Ukraine up 3.1% in 2005: Interfax Statistical Report, v. 15, issue 5, January 21-27, p. 15.

Interfax Mining and Metals Report, 2006a, Ukraine edges up iron ore exports 8.3% in 2005: Interfax Mining and Metals Report, no. 5, January 27-February 2, p. 50.

Interfax Mining and Metals Report, 2006b, Ukraine uses 67.8% of U.S. steel plate quota in 2005: Interfax Mining and Metals Report, no. 01-02, January 1-12, p. 42.

Interfax Mining and Metals Report, 2006c, Ukraine uses 93% of EU steel quota in 2005: Interfax Mining and Metals Report, no. 01-02, January 1-12, p. 41.

Interfax Mining and Metals Report, 2006d, Ukrainian non-CIS iron ore exports in 2005: Interfax Mining and Metals Report, no. 5, January 27-February 2, p. 52.

Kisil', V.V., Konovalov, Y.V., and Zhukov, V.R., 2006, Metallurgicheskiy kompleks Donetskoy oblasti (itogi raboty v 2005 g., perspektivy raxvitiya [The metallurgical complex of Donetsk oblast (Results of work in 2005, perspectives of development)]: Chernaya Metallurgiya (Ferrous Metallurgy), no. 5, p. 5-9.

Kolosov, V.A., and Dyadechkin, N.I., 2005, Sostoyanie i perspektivy rasvitiya syr'yevoy bazy gorno-metallurgicheskogo kompleksa Ukrainiy [Conditions and perspectives for development of Ukraine's mining and metallurgical complex]: Gornyy Zhurnal [Mining Journal], no 5, p. 10-13.

Internet References Cited

Embassy of Ukraine in Japan, 2002, Economy, accessed March 11, 2007, at URL http://www.ukremb-japan.gov.ua/eng/ukraine/economics.

Internet-Gazeta, 2007 (February 26), Ekonomika, accessed February 26, 2007, at URL http://www.economika.com.ua/finance/digest/index.php4/11527.html.

Ukraine Ministry of Foreign Affairs, 2006, Ukraine info.—Natural resources, accessed February 26, 2007, at URL http://www.mfa.gov.ua/main/en/28.htm.

U.S. Department of State, 2006, Ukraine, Background Note, accessed February 26, 2007, at URL http://www.state.gov/r/pa/ei/bgn/3211.htm.

Major Sources of Information

Ministry of Coal Industry
Ministry of Economy
Ministry of Emergencies and Affairs of Population Protection from the Consequences of Chernobyl Catastrophe
Ministry of Environmental Protection
Ministry of Fuel and Energy
Ministry of Industrial Policy
Ministry of Science & Technology
State Committee for State Resources Fund
State Committee for Statistics

UZBEKISTAN

Uzbekistan was a major world producer of two mineral commodities, gold and uranium. It was a significant regional producer of a number of mineral commodities, including nonferrous metals and natural gas.

In 2004 (the latest year for which data were available), the nonferrous metals sector was the leading mineral producing sector, producing 15.4% of the total value of industrial production. It was followed by the fuel sector, with 13.4%; the construction materials sector, with 3.9%; and the ferrous metals sector, with 2.6% (OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistike, 2005a).

Table 66 lists the number of enterprises for various types of mineral production sectors from 2002 to 2004. Table 67 lists the number of workers employed in the various mineral sectors. Table 68 lists the role of state ownership in the mineral production sectors.

Structure of the Mineral Industry

Table 70 is a listing of Uzbekistan's mineral production enterprises. In 2005, two of the country's largest enterprises were the Navoi mining and metallurgical complex (NMMC), which produced gold and uranium, and the Almalyk mining and metallurgical complex, which produced copper, lead, zinc, and byproduct metals, which included gold. NMMC was part of the Uzbekistani state holding company Kyzylkumredmetzoloto.

Gold production was centered at the Muruntau deposit, which is located near the town of Zarafshan. NMMC, which mined the Muruntau deposit, was the leading gold producer in Central Asia. NMMC's gold production has averaged between 57 and 60 t/yr in recent years (Interfax Mining & Metals Report, 2004). NMMC also shared production from the Zarafshan-Newmont joint venture, which NMMC co-owned with the Newmont Mining Corp. The Zarafshan-Newmont joint venture recycled tailings at the Muruntau gold lode. The processing plant was officially opened on May 25, 1995. The joint venture initially contracted to process 220 Mt of ore at an average grade of 1.23 g/t gold that contains 5.1 million ounces (159 t) of recoverable gold. Zarafshan-Newmont employed about 900 people (Newmont Mining Corp., 2005§).

Uranium production in Uzbekistan took place at three in situ leaching (ISL) operations in central Uzbekistan, which were subordinate to NMMC. All uranium production in Uzbekistan was the property of the Uzbekistan Government. Since 1992, all Uzbekistan's uranium production was exported mainly to the United States through the U.S.-based intermediary Nukem, Inc. NMMC produced UO_2 and U_3O_8 (yellowcake) from uranium concentrate derived from ISL operations at Uzbekistan's three operational mining directorates.

Trade

In 2003 and 2004 (the latest years for which trade data were available), the category ferrous and nonferrous metals comprised 6.4% and 8.6%, respectively, of the total value of exports and 7.9% and 10.3%, respectively, of the total value of imports

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for these years (OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistik, 2005b). Trade data for other categories of mineral commodities were not available. Data on the country's two leading export earning mineral commodities, gold and uranium, do not appear to be included in the above trade data.

Mineral Resources

The country has identified more than 2,800 deposits with more than 100 types of mineral raw materials. More than 100 deposits have undergone detailed exploration. Uzbekistan reportedly ranks among the leading five countries in the world in what it terms confirmed reserves of gold and uranium. Among the largest deposits is the Muruntau gold deposit, which is located in the Kyzyl Kum region. This region was one of the leading gold-bearing provinces in the world, with more than 10 other gold deposits besides Muruntau under study. All significant uranium deposits are located in the central Kyzylkum area, which is a 125-km-wide belt that extends 400 km from Uchkuduk in the northwest to Nurabad in the southeast. The country's main copper reserves are found in the ores of the Almalyk region, which also contain large reserves of gold, molybdenum, rhenium, selenium, silver, sulfur, tellurium, and zinc. These other ore constituents account for more than 40% of the value of the ore.

In the central Kyzyl-Kum area, the Dzheroy-Sardara Morroccan-type phosphate deposit has been evaluated to have reserves of 57.7 Mt of phosphate anhydride that are prepared for development. Uzbekistan also has a raw material base for the production of potash fertilizers at the Tyubegatanskoye deposit in southern Uzbekistan; the deposit has what are termed in Uzbekistan's reserve classification system, "explored reserves" of 200 Mt of raw salts with a potassium chloride content of 36.8%.

Outlook

Ore processing from the Zarafshan-Newmont joint venture is scheduled though mid-2011 (Newmont Mining Corp., 2005§). Navoi has drafted a gold industry development program to 2010, which projects gold production to rise by 20% by 2010 (Interfax Mining & Metals Report, 2004).

References Cited

Interfax Mining & Metals Report, 2004, Uzbekistan—Gold survey: Interfax Mining & Metals Report, issue 42, October 1-7, p. 11-13.

OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistike, 2005a, Promyshlennost' Respubliki Uzbekistana 2004 [Industry of the Republic of Uzbekistan 2004]: Tashkent, Uzbekistan, OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistike, p. 29.

OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistik, 2005b, Uzbekistan v tsifrakh 2004 [Uzbekistan in figures 2004]: Tashkent, Uzbekistan, OOP Gosudarstvennogo Komiteta Respubliki Uzbekistana po Statistike, p. 178.

Internet Reference Cited

Newmont Mining Corp., 2005, Zarafshan-Newmont joint venture, accessed March 13, 2007, at URL http://www.newmont.com/en/operations/asia/zarafshan/index.asp.

Major Sources of Information

Kyzylkumredmetzoloto
Ministry of Economics
Ministry of Foreign Economic Relations, Investments, and Trade
State Committee for Nature Protection
State Committee on Land Resources, Geodesy, Cartography and State Cadastre
State Committee on Statistics
State Geology Committee

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TABLE 1
ARMENIA: STRUCTURE OF MINERAL INDUSTRY OUTPUT

(Percentage of the value of total industrial output)

Sector	2001	2002	2003	2004	2005
Metallurgy:					
Ferrous	0.1	0.1	0.0	0.3	0.0
Nonferrous	13.7	16.8	21.7	31.0	37.2
Mining	6.6	9.1	10.9	18.1	17.4

Source: Statistical Yearbook of Armenia 2006, National Statistical Service of the Republic of Armenia, accessed at URL http://www.armstat.am/Arm/StatData/Taregirq_06/indexeng.html.

TABLE 2
ARMENIA: VALUE OF CAPITAL STOCK, BY SECTOR

(Million dollars)[1]

Sector	2001	2002	2003	2004	2005
Chemical and petrochemical	49.9	53.5	72.8	78.8	89.1
Construction materials	30.4	28.1	33.7	39.8	55.5
Electric power	2,979.4	2,870.5	2,339.5	2,402.1	2,060.6
Food industry	26.8	26.4	31.4	27.0	26.5
Light industry	185.8	209.1	230.9	257.2	305.8
Logging, woodworking, pulp and paper	8.0	9.7	9.1	12.7	12.5
Machinery manufacturing and metalworking	147.3	142.8	122.6	141.7	159.8
Metallurgy:					
Ferrous	0.8	0.7	0.7	2.8	0.3
Nonferrous	127.6	147.2	242.8	256.3	333.1
Total[2]	3,556.1	3,487.9	3,083.4	3,218.5	3,043.2

[1]One U.S. dollar equals 334.375 Armenia drams.

[2]Totals may not add due to independent rounding.

Source: Statistical Yearbook of Armenia 2006, National Statistical Service of the Republic of Armenia, accessed at URL http://www.armstat.am/Arm/StatData/Taregirq_06/indexeng.html.

TABLE 3
ARMENIA: INDEX OF VOLUME OF PRODUCTION, BY SECTOR

(Percentage of the previous year)

Sector	2001	2002	2003	2004	2005
Metallurgy:					
Ferrous	86.4	76.5	83.5	119.8	125.3
Nonferrous	133.5	121.5	109.5	104.9	112.9
Mining	119.7	119.6	11.9	110.5	95.4
Of which:					
Metal ores	121.0	119.7	111.6	110.6	95.2
Nonmetallic ores	106.2	117.7	119.1	104.3	105.7

Source: Statistical Yearbook of Armenia 2006, National Statistical Service of the Republic of Armenia, accessed at URL http://www.armstat.am/Arm/StatData/Taregirq_06/indexeng.html.

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TABLE 4
ARMENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Rolled		91	132	10,880 r	7,726 r	--
Foil		2,699	5,240	9,317	6,193	--
Copper:						
Concentrate, Cu content		16,460	16,641	18,068 r	17,700 r, e	16,256
Blister, smelter, primary e		4,000	6,700	7,500	7,500 r	9,800 2
Gold, mine output, Au content	kilograms	1,900	3,200	1,800	2,100	1,400
Molybdenum, concentrate, Mo content		2,943	2,884	2,763	2,950 r, e	3,030
Rhenium e	kilograms	750	800	1,000	1,000	1,200
Silver e	do.	3,000	5,500	4,000	4,000	4,000
Zinc, concentrate, Zn content		745	782	2,056 r	1,927 r	3,196
INDUSTRIAL MINERALS						
Caustic soda		4,900	3,600	1,800 r	2,800 r	6,200
Cement	thousand metric tons	300	355	384	501 r	605
Clays, bentonite, powder		1,000 e	258	642 e	700	550
Diamond, cut	thousand carats	186	370	400	263 r	224
Gypsum		12,800	44,900	57,800	65,000	44,200
Limestone	thousand metric tons	11,900	12,500	13,000	16,000 e	17,000
Perlite e		35,000	35,000	35,000	35,000	35,000
Salt		30,300 r, e	30,300	31,900	31,600 r	34,700

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. -- Zero.

[1]Table includes data available through November 2006.

[2]Reported figure.

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TABLE 5

ARMENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Aluminum, rolled and foil		Armenal (formerly Kanaker aluminum plant)	K'anak'err	25,000
Copper:				
Mine output, Cu content		Facilities in operation:		30,000 [3]
		Agarak copper-molybdenum mining and processing complex	Agarak	
		Kapan mining directorate	Kapan	
		Zangezur copper-molybdenum complex mining Kadzharan deposit	Kadzharan	
		Facilities not in operation:		
		Akht'ala mining directorate	Akht'ala	
		Shamlugh mining directorate	Shamlugh	
Blister		Armenian Copper Programme cjsc (ACP)	Alaverdi	15,000
Diamond, cut stones		Aghavni diamond-cutting works[4]	Nor Geghi	NA
Do.		Amma group diamond-cutting works[4]	Artashat	NA
Do.		Andranik-Dashk diamond-cutting works	Nor Hachyn	NA
Do.		Arevakn diamond producing plant	do.	NA
Do.		Diamond Company of Armenia (DCA)	Yerevan	NA
Do.		Diamond Tech	Talin	NA
Do.		Lori diamond-cutting works	Nor Hachyn	NA
Do.		Lusampor[4]	Melik'gyugh	NA
Do.		Punji diamond-cutting works[4]	Yerevan	NA
Do.		Sapphire diamond-cutting works	Nor Hachyn	NA
Do.	thousand carats	Shoghakan gem-cutting plant	do.	120
Gold	kilograms	Zod mining complex	Zod	2,000
Do.		Megradzor deposit	Megradzor	NA
Do.		Lichkvazkoye, Shaumyanskiy Rayon, Sotkskoye, and Terterasarskoye deposits	NA	NA
Iron ore		Hrazdan deposit	Sulagyan Mountains	NA
Molybdenum, mine output, Mo content		Zangezur copper-molybdenum complex, mining Kadzharan deposit	Kadzharan	20,400
Do.		Agarak copper-molybdenum mining and processing complex	Agarak	2,000
Perlite	thousand metric tons	Aragats-Perlite mining-beneficiation complex	Aragats deposit	1,110
Zinc, mine output, Zn content		Kapan mining directorate	Kapan	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

[4]Current existence of enterprise can not be confirmed.

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TABLE 6
ARMENIA: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Natural or cultured pearls, precious or semiprecious stones:	335,461,175	100.0
Of which:		
Belgium	118,510,928	35.33
Israel	111,999,424	33.39
United States	49,700,830	14.82
Switzerland	22,549,913	6.72
Iron and steel:	240,699,954	100.0
Of which:		
Netherlands	110,486,090	45.90
Germany	90,644,145	37.66
British Virgin Islands	21,812,849	9.06
Copper and articles thereof:	46,944,153	100.0
Of which:		
Germany	39,369,850	83.87
Netherlands	3,353,488	7.14
Ores, slag and ash:	45,346,110	100.0
Of which:		
British Virgin Islands	23,809,200	52.51
Germany	6,046,977	13.34
Netherlands	4,233,011	9.33
Belize	3,959,501	8.73
Iran	2,752,547	6.07
Switzerland	2,546,702	5.62
Molybdenum ores and concentrates:	27,524,137	100.00
Of which:		
British Virgin Islands	23,809,200	86.50
Netherlands	1,716,905	6.24
IMPORTS		
Natural or cultured pearls, precious or semiprecious stones:	347,588,659	100.0
Of which:		
Belgium	146,299,493	42.09
Israel	101,531,056	29.21
Switzerland	28,376,862	8.16
United States	23,522,476	6.77
Luxembourg	22,729,023	6.54
Mineral fuels, mineral oils and products of their distillation:	261,998,473	100.0
Of which:		
Russia	92,014,711	35.12
Panama	63,178,053	24.11
United Kingdom	51,917,319	19.82
Iran	37,120,302	14.17

[1]Commodity groups are in order by value.
[2]Percentages listed by country for each commodity may not add to 100%.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 7
ARMENIA: MINERAL RESERVES

(Thousand metric tons unless otherwise specified)

Commodity		Quantity
Copper		7,200
Gold[1]	metric tons	379
Molybdenum		790

[1]Reported as a resource.

Source: Mining Journal, Armenia, Special publication, London, November 2005, p. 12.

TABLE 8
AZERBAIJAN: STRUCTURE OF MINERAL INDUSTRY OUTPUT

(Percentage of the value of total industrial output)

Sector	2001	2002	2003	2004	2005
Extractive	58.7	59.5	56.9	57.5	66.7
Petroleum refining	14.9	14.0	15.4	13.8	10.5

Source: Azerbaijan in Figures, 2006, State Statistical Committee of Azerbaijan Republic, accessed at URL http://www.azstat.org/publications/azfigures/2006/en/index.shtml.

TABLE 9
AZERBAIJAN: MINERAL INDUSTRY LABOR FORCE, BY SECTOR

(Thousand persons)

Sector	2001	2002	2003	2004	2005
Extractive	35.5	34.9	38.6	39.6	40.3
Metallurgy and metal fabrication	9.2	11.3	12.3	13.1	13.1
Petroleum refining	6.2	6.3	6.4	6.8	6.8

Source: Azerbaijan in Figures, 2006, State Statistical Committee of Azerbaijan Republic, accessed at URL http://www.azstat.org/publications/azfigures/2006/en/index.shtml.

TABLE 10
AZERBAIJAN: CONSUMPTION OF MAJOR MINERAL FUELS, BY SECTOR

Sector		2001	2002	2003	2004	2005
Crude oil	metric tons	6.3	6.4	6.3	6.4	7.5
Natural gas	billion cubic meters	8.3	8.3	8.7	9.2	9.5

Source: Databases of Statistical Information, Balance of Fuel Energy, 2006, State Statistical Committee of Azerbaijan Republic, accessed at URL http://www.azstat.org/statinfo/balance_fuel/en/index.shtml.

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TABLE 11

AZERBAIJAN: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum, primary and secondary		--	--	18,565	29,537	31,762
Alumina	thousand metric tons	88 r	91	180	232	315
Iron ore, marketable:						
Gross weight		4,700	400 e	3,100	19,100	7,300
Fe content[e]		2,700	230	1,800	11,100	3,650
Steel:						
Crude		1,605	524	1,531	21,570	58,912
Pipes		2,076	2,545	5,400 r	84	1,257
INDUSTRIAL MINERALS						
Bromine[e]		2,000	2,000	2,000	2,000	2,000
Caustic soda		21,800 r	20,500 r	21,600 r	24,700 r	30,000
Cement		522,600	847,700	1,012,700	1,427,500 r	1,537,500
Gypsum		1,750	1,039	3,848	8,840 r	28,242
Iodine		1,016 r	377 r	349 r	300 r	300
Limestone		577,900	631,500	762,000	1,273,000 r	1,256,443
Salt		3,734	5,380	7,645	9,234	10,319
Sulfuric acid		9,500	17,000	22,500 r	26,700 r	18,700
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	thousand cubic meters	5,534,600	5,143,700	5,127,700	4,995,400	5,732,100
Petroleum:						
Crude		14,909,100	15,333,500	15,251,300	15,348,800	21,993,600
Refinery products		5,200,000 r, e	6,051,900	6,156,400	6,607,200	7,655,900

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]For some metals, including copper, gold, lead, molybdenum, silver, and zinc, and for a number of industrial minerals that Azerbaijan produced, data were not sufficient to derive production estimates or to determine if production had ceased.

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TABLE 12
AZERBAIJAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Locations or deposit names	Annual capacity[e]
Aluminum thousand metric tons	Sumgait smelter	Sumqayit	100 to 150
Alumina	Gyandzha refinery	Ganca	100,000
Alunite ore	Zaglik alunite mining directorate	Zaglik, Dashcasan Region	600,000
Arsenic	Bitibulagh enargite deposit	Gedabay	NA
Do.	Daridagh red orpiment-realgar deposit	Julpha	NA
Do.	NA	Dzhul'finskiy Region	NA
Barite	Azad, Bashgishlag, Chaycand, Chovdar, Gusgchu, Tonashen, and Zaylik deposits	Khanlarskiy Region	NA
Bauxite	Permian deposit	Nakhichevan Region	NA
Cement	Plants:	Locations:	1,000,000[3]
	Karadagly	Karadagly	
	Tauz	Tauz Region	
Chromite	Epack, Goydara, Kazimbinasy, Khatavang	Calbajar and Lachin Regions	NA
Clays:			
Bentonite	Dash-Salakhlinskoye deposit	do.	1,000,000
Refractory	Chardakhla deposit	Chardakhla	NA
Construction materials:			320,000
Building sawn stone-block	Aidagh, Dash Salahly, Dilagarda, Dovlatyarly, Gozdak, Mardacan, Naftalan, Shahbulag, and Zayam deposits	NA	
Facing stone	Dashcasan, Gulably, Gulbacht, and Shahtahty deposits	NA	
Copper	Karadagskiy complex	Shamkhorskiy Region	30,000
Dolomite	Negram and Kobustan deposits	do.	NA
Gemstones, precious and semiprecious	Agate, chalcedony, and heliotrop deposits	Santon	NA
Do.	Amethyst, garnet, and granite deposits	Gedebey Rayonu	NA
Gypsum	Deposits:	Locations:	
	Agdjakend deposit	Kazakhskiy Region	40,600
	Araz deposit	Nakhichevan Region	
	Jukhary Aghjacand anhydrite deposit	Goranboy Region	
Iodine and bromine	Baku, Karadagly, and Neftechala plants	Process oil well brines at plants in Baku, Karadagly, and Neftechala	NA
Iron ore, marketable	Dashkasan mining directorate	Dashkasan Region	1,400,000
Lead-zinc ore	Gumushlu deposit	Ordubadskiy and Norashenskiy Regions	NA
Limestone	Dashkesan deposit	Dashkasan Region	NA
Natural gas, processing	Karadagly plant	Near Baku	NA
Quartz sands	Miocene-Pliocene deposits	Gobustan, Absheron Peninsula, Guba Region	10,000
Petroleum and natural gas:[4]			
Crude petroleum and gas condensate	State Oil Company of Azerbaijan Republic (SOCAR)	Production from 37 onshore deposits, which includes deposits on the Ashperon Peninsula and in the Izhnekurin Valley	3,000,000[3]
Do.	do.	Production from 17 offshore fields and almost 50% of crude petroleum produced from the Guneshli field	19,000,000[3]
Natural gas million cubic meters	Azneft, a subsidiary of State Oil Company of Azerbaijan Republic (SOCAR)	Almost all production from offshore fields with more than 50% of natural gas produced from the Bakharly field	6,000[3]
Do.	NA	Guneshli, Nakhchyvan, and Shah-Deniz offshore fields	NA

See footnotes at end of table.

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TABLE 12—Continued
AZERBAIJAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Locations or deposit names	Annual capacity[e]
Petroleum, refined	24-gallon barrels	Azernefteyag (formerly Baku) refinery	Baku	83,950,000 [4]
Do.	do.	Azernefteyagandzhah (formerly Novo-Baku refinery)	do.	77,380,000 [4]
Rock salt		Hehram and Pusyan deposits	Nakhichevan Region	2,500,000
Steel:				
Crude		OAO Azerboru	Sumqayit	800,000
Rolled		do.	do.	700,000
Pipe, tubes		do.	do.	540,000

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.
[1]Table includes data available through December 2006.
[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.
[3]Capacity estimates are totals for all enterprises that produce that commodity.
[4]Capacity for crude petroleum distillation.

TABLE 13
AZERBAIJAN: STRUCTURE OF EXPORTS AND IMPORTS OF MINERAL PRODUCTS

(Percentage of the value of total trade)

Commodity	2004		2005	
	Exports	Imports	Exports	Imports
Aluminum and articles thereof	1.35	0.31	0.03	1.44
Cement, earths, lime, salt, stone, sulfur	0.03	1.44	0.04	1.70
Fertilizers	0.00	0.28	0.00	0.34
Iron and steel	1.17	2.50	0.87	2.93
Mineral fuels, mineral oil, products of their distillation	82.20	11.43	76.60	11.87
Ores, slag, ash	0.00	1.56	0.00	1.65

Source: Databases of Statistical Information, External Economic Activities, 2006, State Statistical Committee of Azerbaijan Republic, accessed at URL http://www.azstat.org/statinfo/external_economic_activities/en/xten_10.shtml.

TABLE 14
AZERBAIJAN: MAJOR MINERAL COMMODITY EXPORTS IN 2004

(Metric tons)

Commodity	Quantity	To CIS[1]	To rest of world
Alumina	231,800	214,400	17,400
Boiler fuel	338,200	11,400	326,800
Coke oil	23,262	--	23,262
Crude petroleum	9,022,400	100	9,022,300
Diesel fuel	1,364,900	253,800	1,111,100
Gasoline	388,600	226,700	161,900
Kerosene	323,100	127,000	196,100

-- Zero.
[1]Commonwealth of Independent States.

Source: The Foreign Trade of Azerbaijan 2000-04, State Statistical Committee of Azerbaijan Republic, Baku, Azerbaijan, 2005, p. 266-267.

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TABLE 15
AZERBAIJAN: MAJOR MINERAL COMMODITY IMPORTS
AND EXPORTING COUNTRIES IN 2004

(Metric tons unless otherwise specified)

Commodity and country		Quantity
Asbestos:		
Kazakhstan		3,570
Russia		7,022
Total		10,592
Barite:		
Iran		13,085
Kazakhstan		27,788
Russia		260
Turkey		3,692
Total		44,825
Bauxite:		
Guinea		407
India		478
Total		885
Boiler fuel:		
Turkmenistan		146,180
United Kingdom		2
Total		146,182
Cement:		
Clinker:		
Georgia		75,732
Russia		471,240
Turkey		1,300
Total		548,272
Hydraulic:		
China		620
Georgia		39,330
Iran		23,420
Russia		97,381
Turkey		7,289
Ukraine		58,313
United Kingdom		300
Other		110
Total		226,763
Diesel fuel, Turkmenistan		40,092
Ferroalloys:		
Kazakhstan		1,704
Russia		576
Ukraine		3,263
Other		143
Total		5,686
Natural gas:	million cubic meters	
Kazakhstan	do.	2,646
Russia	do.	578
Turkmenistan	do.	619
Uzbekistan	do.	956
Total	do.	4,799

Source: The Foreign Trade of Azerbaijan 2000-04, State Statistical Committee of Azerbaijan Republic, Baku, Azerbaijan, 2005, p. 268-288.

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TABLE 16
AZERBAIJAN: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Mineral fuels, mineral oils and products of their distillation	3,337,035,109	100.00
Of which:		
Italy	1,289,058,611	38.63
France	402,367,074	12.06
Turkey	202,794,947	6.08
Israel	194,667,235	5.83
Georgia	184,198,959	5.52
Croatia	176,273,311	5.28
Inorganic chemicals, precious metal compounds, isotopes	101,270,961	100.00
Of which:		
Tajikistan	77,160,825	76.19
Iran	7,575,433	7.48
United States	6,314,749	6.24
IMPORTS		
Mineral fuels, mineral oils and products of their distillation	499,672,514	100.00
Of which:		
Turkmenistan	236,127,623	47.26
Uzbekistan	90,789,174	18.17
Russia	65,300,739	13.07
Kazakhstan	64,376,465	12.88
Articles of iron or steel	308,060,958	100.00
Of which:		
United Kingdom	60,375,078	19.60
Ukraine	41,844,692	13.58
Russia	34,375,731	11.16
Japan	29,483,193	9.57
Germany	20,602,724	6.69
Malaysia	16,504,865	5.36

[1]Commodity groups are in order by value.
[2]Percentages listed by country for each commodity may not add to 100%.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

TABLE 17
BELARUS: VALUE OF INDUSTRIAL PRODUCTION IN 2005, BY SECTOR[1]

(Percentage of total)

Sector	Percentage
Chemical and petrochemical	11.3
Construction materials	4.2
Electrical energy	6.2
Ferrous metallurgy	3.7
Food processing	16.2
Forestry, wood processing, paper	4.8
Fuel industry	21.7
Light industry	4.7
Nonferrous metallurgy	0.1

[1]Evaluated in current prices.

Source: Belarus' i Rossiya 2006, Ministerstvo Statistiki i analiza Respubliki Belarus' and Federal'naya sluzhba gosudarstvennoy statistiki, Statisticheskiy sbornik, Moscow, 2006.

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TABLE 18
BELARUS: UTILIZATION OF MINERAL PRODUCTION CAPACITY

(Percentage)

Commodity	2001	2002	2003	2004	2005
Ammonia, synthetic	98	100	100	100	100
Cement	100	100	100	100	100
Mineral fertilizers	76	90	97	99	99
Oil refining	68	55	53	53	58
Steel:					
Crude	89	91	93	96	96
Rolled	100	100	97	100	100
Sulfuric acid	61	60	63	76	81

Source: Belarus' i Rossiya 2006, Ministerstvo Statistiki i analiza Respubliki Belarus' and Federal'naya sluzhba gosudarstvennoy statistiki, Statisticheskiy sbornik, Moscow, 2006.

TABLE 19
BELARUS: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Steel:						
Crude	thousand metric tons	1,611	1,607	1,694	1,920	2,076
Rolled	do.	1,400	1,400	1,425	1,580	1,700
Pipes		42,400	76,700	96,200	109,700 r	108,300
INDUSTRIAL MINERALS						
Cement	thousand metric tons	1,803	2,171	2,472	2,731	3,131
Diamond, synthetic[e]	thousand carats	25,000	25,000	25,000	25,000	25,000
Nitrogen, N content of ammonia		725,000	799,000	726,000	770,000 r	780,000
Potash, K_2O equivalent[e]	thousand metric tons	3,700 [2]	3,800	4,230	4,600 r	4,844
Salt[3]		1,052,000 r	1,367,000 r	1,543,000 r	1,883,000 r	1,839,000
Sulfur[e]		20,000	25,000	30,000	30,000	30,000
Sulfuric acid[e]		-- r	-- r	-- r	-- r	--
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	255	246	254	245 r	228
Peat:						
Horticultural use[e]		200,000	200,000 [2]	100,000	100,000	100,000
Fuel use		1,997,000	2,201,000	1,802,000	2,008,000 r	2,308,000
Total		2,197,000	2,401,000	1,902,000	2,108,000 r	2,408,000
Petroleum:						
Crude	thousand metric tons	1,852	1,846	1,820	1,804	1,785
Refined	do.	13,346	15,247	15,774	18,451	19,802

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]Reported figure.

[3]Includes byproduct salt from potash production.

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TABLE 20
BELARUS: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Cement	Krichevskiy and Volkovysk plants	Mahilyowskaya and Wawkavysk Voblasts'	2,200,000
Diamond	Gomel Production Association "Kristall"	Homyel'skaya Voblasts'	NA
Nitrogen, N content of ammonia	Grodno "Azot" Association	Hrodna Region	1,000,000
Peat, fuel use	Production at 37 enterprises that produce mainly briquets	All regions of country	5,000,000 [2]
Petroleum:			
Crude	Belarusneft Association	Southeastern part of country	2,000,000
Refined	Mazyr refinery	Mazyr	16,000,000 [3]
Do.	Naftan refinery	Navapolatsk	8,450,000 [3]
Potash, K_2O equivalent	Belaruskali Production Association	Salihorsk area	5,000,000
Steel:			
Crude	Belarusian Steelworks	Zhlobin	1,400,000
Pipe	Mogilev Metallurgical Works jsc	Mahilyowskaya Voblasts'	80,000

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.
[1]Table includes data available through December 2006.
[2]Total peat for fuel use production.
[3]Crude throughput.

TABLE 21
BELARUS: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Mineral fuels, mineral oils and products of their distillation:	5,557,092,400	100.00
Of which:		
Netherlands	2,327,368,600	41.88
United Kingdom	1,071,373,500	19.28
Poland	520,795,100	9.37
Germany	309,366,700	5.57
Fertilizers:	1,117,962,700	100.00
Of which:		
China	263,257,700	23.55
Brazil	165,583,800	14.81
United States	120,651,400	10.79
Poland	79,551,700	7.12
Iron and steel:	638,008,800	100.00
Of which:		
Russia	222,416,700	34.86
Italy	41,449,300	6.50
Poland	33,533,300	5.26
IMPORTS		
Mineral fuels, mineral oils and products of their distillation:	5,524,082,800	100.00
Of which Russia	5,482,829,700	99.25
Iron and steel:	1,097,927,400	100.00
Of which:		
Russia	821,724,500	74.84
Ukraine	191,421,600	17.43

[1]Commodity groups are in order by value.
[2]Percentages listed by country for each commodity may not add to 100%.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 22
GEORGIA: DISTRIBUTION OF MINING AND QUARRYING ENTERPRISES BASED ON THE TYPE OF MINING AND QUARRYING

(Number of enterprises)

Type of mining and quarrying	2001	2002	2003	2004	2005
Coal mining	3	6	5	4	6
Extraction of crude oil and natural gas	2	2	2	2	2
Mining of metal ores	22	21	23	33	40
Other mining and quarrying	62	62	69	78	100

Source: State Department of Statistics in Georgia, 2006, accessed January 18, 2007, at URL http://www.statistics.ge/index.php?plang=1.

TABLE 23
GEORGIA: DISTRIBUTION OF LABOR FORCE AMONG MINING AND QUARRYING ENTERPRISES

(Thousand persons)

Enterprises	2001	2002	2003	2004	2005
Coal mining	0.7	0.7	0.5	0.5	0.5
Extraction of crude oil and natural gas	0.8	0.8	0.8	0.9	1.0
Mining of metal ores	3.8	3.9	4.0	4.6	5.7
Other mining and quarrying	1.2	1.3	1.2	1.3	1.4

Source: State Department of Statistics in Georgia, 2006, accessed January 18, 2007, at URL http://www.statistics.ge/index.php?plang=1.

TABLE 24
GEORGIA: DISTRIBUTION OF THE VALUE OF INDUSTRIAL PRODUCTION CONTRIBUTED BY TYPE OF MINING ACTIVITY

(Percentage of value of total industrial production)

Type of mining activity	2001	2002	2003	2004	2005
Coal mining	(1)	(1)	(1)	(1)	(1)
Extraction of crude oil and natural gas	2.5	4.2	5.5	5.4	5.3
Mining of metal ores	2.9	3.8	4.9	4.9	4.3
Other mining and quarrying	0.6	0.4	0.6	0.5	0.8

[1]Less than 0.05%.

Source: State Department of Statistics in Georgia, 2006, accessed January 18, 2007, at URL http://www.statistics.ge/index.php?plang=1.

TABLE 25
GEORGIA: DISTRIBUTION OF THE VALUE OF CAPITAL STOCK MINING AND QUARRYING ENTERPRISES BASED ON THE TYPE OF MINING AND QUARRYING

(Percentage)

Type of mining and quarrying	2001	2002	2003	2004	2005
Coal mining	0.4	0.3	0.3	0.3	0.2
Extraction of crude oil and natural gas	1.3	1.2	1.0	0.9	1.0
Mining of metal ores	1.7	1.8	1.8	1.8	1.8
Other mining and quarrying	0.4	0.4	0.4	0.4	0.4

Source: State Department of Statistics in Georgia, 2006, accessed January 18, 2007, at URL http://www.statistics.ge/index.php?plang=1.

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TABLE 26
GEORGIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity	2001	2002	2003	2004	2005
METALS					
Copper, mine output, Cu content of concentrate[e]	8,000	10,000	12,000	12,000	12,000
Gold[e] kilograms	2,000	2,000	2,000	2,000	2,000
Iron and steel:					
Ferroalloys, electric furnace:					
Ferromanganese	7,800 [r]	4,200 [r]	12,400 [r]	12,800 [r]	13,000
Silicomanganese[e]	32,800 [r]	30,400 [r]	50,900 [r]	91,900 [r]	92,000
Total[e]	40,600 [r]	34,600 [r]	63,300 [r]	104,700 [r, 2]	105,000
Lead, mine output, Pb content[e]	200	400	400	400	400
Manganese ore, marketable:					
Gross weight	98,400	103,400	173,500	218,700	251,800
Mn content[e]	28,500	30,000	50,500	63,600	73,000
Silver kilograms	33,000	33,000 [e]	33,000	33,000	33,000
Zinc, mine output, Zn content of concentrate[e]	350	400	400	400	400
INDUSTRIAL MINERALS					
Barite[e]	15,000	15,000	15,000	15,000	15,000
Cement	335,200	346,800	344,800 [r]	424,600 [r]	450,000 [e]
Clays, bentonite[e]	7,000	7,000	9,700	1,800	2,000
Nitrogen, N content of ammonia	47,600 [r]	91,500 [r]	102,300 [r]	107,800 [r]	130,000 [e]
Perlite	NA	NA	NA	45,000 [e]	45,000 [e]
Salt[e]	30,000	30,000	30,000	30,000	30,000
Zeolites	NA	NA	NA	NA	NA
MINERAL FUELS AND RELATED MATERIALS					
Coal, bituminous	5,000	6,100 [r]	8,000	8,000	8,000
Natural gas million cubic meters	40,200	16,700	17,800	6,100 [r]	14,800
Petroleum:					
Crude	98,800	73,900	139,700	97,600	66,700
Refined	11,800	16,700 [r]	18,600	37,500	40,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available.
[1]Table includes data available through November 2006.
[2]Reported figure.

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TABLE 27

GEORGIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Arsenic:	Deposits:	Locations:	2,000 [3]
As content of ore	Lukhumi deposit	Ambrolauri Region	
	Tsani deposit	Lentekhi Region	
Metal and compounds	Racha mining and chemical plant	Racha	NA
Do.	Tsana mining and chemical plant	Ts'ana	NA
Barite	Chordskoye deposit	Onis Raioni (Onskiy Rayon)	70,000
Do.	NA	Madneuli deposit	NA
Barite-zinc	NA	Kvaisi deposit	NA
Bentonite	Gumbrskoye and Askanskoye deposits	Gumbra and Askana Regions	200,000 [3]
Cement	Rust'avi cement plant	Rust'avi	1,500,000
Coal	Akhaltsikhe, Tkibuli-Shaorskoye, and Tkvarchelskoye deposits	Akhalts'ikhis Raioni, Tqibuli, and Tqvrach'eli Regions	300,000 [3]
Copper, Cu content of ore	Madneuli complex	Bolnisi Region	12,000
Diatomite	Kisatibskoye deposit	K'isat'ibi Region	150,000
Ferroalloys:			
Ferromanganese	Zestafoni plant	Zestap'onis Raioni	100,000
Silicomanganese	do.	do.	250,000
Manganese sinter	do.	do.	250,000
Gold	Georgian-Austrian joint venture (Quartzite)	Madneuli deposit	3
Iron ore	Hrazdan deposit	Sulagyan Mountains	NA
Do.	Tkibuli-Shaorskoye deposit	Tqibuli Region	NA
Lead-zinc:			
Pb content of ore	Kvaisi deposit	Kvaisi	1,200
Zn content of ore	do.	do.	3,000
Manganese, marketable ore	Chiaturmarganets complex	Chiat'ura-Sach'kheris Raioni field	200,000
Petroleum:			
Crude	About 60 wells that account for 98% of output	Mirzaani, Sup'sa, and Zemo T'elet'i Regions	200,000 [3]
Refined	Batumi refinery	Bat'umi	NA
Do.	Sartichala refinery	Sartichala	NA
Steel, crude	Rust'avi steel mill	Rust'avi	1,400,000
Zinc, mine output, Zn content	Kapan mining directorate	Kapan	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimate is the total for all enterprises that produce that commodity.

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TABLE 28
GEORGIA: MAJOR MINERAL COMMODITY EXPORTS AND IMPORTS

Commodity and country[1]	2003 Value (thousand dollars)	2003 Quantity (metric tons)	2004 Value (thousand dollars)	2004 Quantity (metric tons)
EXPORTS				
Ferrous waste and scrap, remelting scrap ingots of iron and steel:	60,061	974,574	95,948	786,560
Of which:				
India	576	5,055	4,401	38,079
Seychelles	--	--	2,074	11,521
Singapore	722	14,059	2,348	22,005
Turkey	55,277	924,574	82,134	679,254
United States	277	4,821	1,369	13,892
Other countries	3,209	26,065	3,622	21,809
Ferroalloys:	26,100	62,146	42,510	104,796
Of which:				
Italy	760	2,000	2,280	6,000
Netherlands	3,640	9,580	4,028	10,600
Russia	5,716	9,664	12,299	29,046
Turkey	463	1,221	4,590	11,845
United States	9,310	24,500	14,883	35,850
Other countries	6,211	15,181	4,430	11,455
Copper ores and concentrates:	23,439	72,170	31,825	61,870
Of which:				
Bulgaria	--	--	11,872	22,202
Germany	--	--	4,589	9,694
Romania	--	--	716	1,344
Spain	--	--	3,837	7,631
Switzerland	3,439	72,170	10,809	20,999
Other countries	20,000	(2)	2	(2)
Mineral of chemical fertilizers, nitrogenous:	18,445	185,318	28,756	242,493
Of which:				
Armenia	3,538	36,738	4,701	44,762
France	3,386	33,095	6,132	52,149
Greece	2,907	23,953	3,712	28,938
Spain	3,604	39,075	3,822	30,580
Turkey	691	5,681	5,262	42,700
Other countries	4,319	46,776	5,127	43,364
IMPORTS				
Petroleum and petroleum oils:	104,851	407,033	186,450	524,267
Of which:				
Azerbaijan	77,659	315,113	131,733	388,087
Bulgaria	2,210	7,411	11,596	29,674
Greece	4,087	12,772	4,743	11,205
Romania	10,072	32,120	11,173	26,142
Turkmenistan	6,415	25,073	22,145	57,639
Other countries	4,408	14,544	5,060	11,520
Other tubes and pipes, having circular cross-sections, of iron and steel:	93,723	143,182	80,048	106,225
Of which:				
Armenia	--	--	101	624
Azerbaijan	--	--	208	6
Germany	--	--	160	115
Italy	648	564	115	84
United Kingdom	92,805	141,835	79,324	105,242
Other countries	270	783	140	154

See footnotes at end of table.

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TABLE 28—Continued
GEORGIA: MAJOR MINERAL COMMODITY EXPORTS AND IMPORTS

Commodity and country[1]	2003 Value (thousand dollars)	2003 Quantity (metric tons)	2004 Value (thousand dollars)	2004 Quantity (metric tons)
IMPORTS—Continued				
Petroleum gases and other gaseous hydrocarbons:	66,011	757,619	80,080	915,785
Of which:				
Russia	60,554	726,620	73,934	887,170
Kazakhstan	3,942	18,976	4,065	14,353
Azerbaijan	1,332	10,156	2,044	14,248
Turkey	39	72	36	14
United Arab Emirates	--	--	1	(2)
Other countries	144	1,795	--	--

-- Zero.
[1]Commodity groups are in order by value.
[2]Less than ½ unit.

Source: External Trade of Georgia 2004, Statistical Collection, Tbilisi, 2004, p. 278.

TABLE 29
GEORGIA: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Iron and steel:	167,709,847	100.0
Of which:		
Turkey	77,257,848	46.07
Russia	18,520,861	11.04
Seychelles	12,592,615	7.51
United States	11,421,128	6.81
Pearls, precious stones, metals, coins, and so forth:	39,413,600	100.0
Of which:		
Canada	32,679,505	82.91
United Kingdom	5,417,439	13.75
IMPORTS		
Mineral fuels, mineral oils and products of their distillation:	495,870,000	100.00
Of which:		
Azerbaijan	194,784,232	39.28
Russia	114,393,056	23.07
Turkmenistan	55,013,899	11.09
Romania	38,051,240	7.67
Bulgaria	33,599,287	6.78

[1]Commodity groups are in order by value.
[2]Export and import country percentages may not add to 100%.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 30
KAZAKHSTAN: INDUSTRIAL PRODUCTION, BY SECTOR

(Percentage of total)

Sector	2000	2001	2002	2003	2004
Manufacturing:					
Of which:					
Chemical industry	1.0	1.2	1.3	1.4	1.1
Food processing	13.3	13.9	10.7	10.6	9.5
Machine manufacturing	2.5	3.4	3.1	3.3	3.3
Metallurgy and metal working	20.9	18.7	17.7	17.0	16.8
Of which, metallurgy	20.3	17.9	17.0	16.2	16.1
Nonmetallic mineral products	0.8	1.2	1.3	1.6	1.9
Petroleum refinery products, nuclear fuel					
Of which, petroleum refinery products	3.3	3.9	3.6	4.2	3.4
Production of coke	3.9	4.3	3.9	4.4	3.6
Rubber and plastics	0.2	0.3	0.4	0.5	0.5
Textiles	2.0	2.0	1.7	1.3	1.0
Other	1.8	1.9	3.0	2.9	2.7
Mining:					
Of which:					
Coal mining	1.5	1.7	1.4	1.4	1.1
Crude petroleum and condensate gas	38.0	36.1	39.5	39.6	43.1
Metal ore mining	3.0	3.3	3.5	3.4	4.2
Natural gas extraction	0.5	0.6	0.4	0.4	0.6
Other mining	1.5	2.6	3.1	3.4	3.6
Production and distribution of electricity, gas, and water	9.0	8.8	8.8	8.7	7.1

Source: International Monetray Fund, 2005, International Monetary Fund Country Report no. 05/239, Republic of Kazakhstan: Statistical Appendix, July, p. 4.

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TABLE 31

KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Alumina	thousand metric tons	1,231	1,386	1,419	1,468	1,505
Bauxite		3,685,100	4,376,600	4,737,100	4,705,600	4,800,000 e
Arsenic trioxide[e]		1,500	1,500	1,500	1,500	1,500
Bismuth:[e]						
Mine output, Bi content		252	161	150	150	140
Metal, refined		130	130	130	130	120
Cadmium, metal		1,250 e	1,300	1,351	1,900 r	2,000 e
Chromite		2,045,700	2,369,400	2,927,500	3,287,000 r	3,579,000
Cobalt, mine output, Co content[e]		300	300	300	300	300
Copper:						
Mine output, Cu content[e]		470,100 [2]	474,000 r	485,000	461,000 r, [2]	402,000
Metal:						
Smelter, undifferentiated		433,600	446,200	431,930	445,200 r	425,000 e
Refined, primary		425,700	453,000	432,511 r	445,268 r	418,833
Gallium[e]		25	20 r	25	5	7
Gold:						
Mine output, Au content	kilograms	25,010	22,402	30,000 e	30,000 e	18,062
Metal, refined	do.	15,226	10,959	9,906 r	9,576	9,788
Iron and steel:						
Iron ore, marketable:						
Gross weight		14,140,000	17,675,000 r	19,300,000 r	20,300,000	16,469,900
Fe content		8,000,000	10,000,000 r	10,933,000	11,499,000	9,300,000 e
Metal:						
Pig iron		3,906,500	4,089,100	4,140,000 e	4,300,000 r	3,581,090
Ferroalloys:						
Ferrochromium		761,900	835,800	993,000	1,081,000	1,156,168
Ferrochromiumsilicon		79,800	108,028	98,130	104,800	97,870
Ferromanganese		5,349	2,278	1,931	2,000 e	2,100
Ferrosilicon		145,800	126,968 r	127,300	103,580 r	104,185
Silicomanganese		141,200	164,000	178,920	155,300	170,214
Other[e]		9,000	9,000	9,000	9,000	9,000
Total		1,143,049	1,246,074 r	1,408,281	1,455,680 r	1,539,537
Steel:						
Crude		4,691,000	4,868,000	5,066,600	5,371,700	4,452,000
Finished, rolled		3,700,000	3,800,000	3,837,800	4,039,700	3,195,000
Lead:						
Concentrate, Pb content		37,700	46,000 r	37,500	33,000	44,000
Refined, primary and secondary		158,700	1,622,000 r	133,200	157,000 e	131,316
Magnesium, metal, primary[e]		16,000	18,000	14,000	18,000	20,000
Manganese ore, crude ore:						
Gross weight		1,386,500	1,835,000 r	2,369,000 r	2,318,000	2,207,700
Mn content[e]		350,000	460,000 r	580,000	570,000 r	540,000
Molybdenum, concentrate, Mo content[e]		225	230	230	230	230
Nickel, Ni content of laterite ore		--	--	--	--	193
Rhenium[e]	kilograms	2,500 r	2,600 r	2,600 r	5,000 r	8,000
Silicon		NA	NA	83,000	88,000	95,000
Silver, mine output, Ag content	kilograms	981,900	855,612 r	804,874 r	707,443 r	832,000 e
Titanium sponge		14,000	14,900	12,500	16,500	19,000
Vanadium, ores, concentrates, slag, Va content[e]		1,000	1,000	1,000	1,000	1,000
Zinc:						
Mine output, Zn content		344,300	392,000 r	394,000 r	361,000 r	400,000 e
Smelter, primary and secondary		277,100	286,454 r	294,566 r	316,731 r	356,907

See footnotes at end of table.

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TABLE 31—Continued
KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS						
Asbestos, all grades		271,300	291,100	354,500	346,500	355,000 e
Barite		72,000	79,000 r	219,200	310,700	120,000 e
Boron[e]	thousand metric tons	30	30	30	30	30
Cement		2,029,200	2,129,400	2,569,700 r	3,662,000	3,974,800
Clays, kaolin[e]		70,000	70,000	70,000	70,000	70,000
Gypsum		NA	710,700	711,000 e	800,000	820,000
Phophate rock:						
Gross weight		97,000	136,500	168,600	229,800	230,000 e
P_2O_5 content		28,000	39,600	48,900	66,700	52,000 e
Sulfur, byproduct:[e]						
Metallurgy		310,000	260,000	325,000	325,000	325,000
Natural gas and petroleum		1,400,000	1,600,000	1,600,000	1,650,000	1,700,000
Total		1,710,000	1,860,000	1,930,000	1,980,000	2,030,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:		79,000,000	73,731,000	84,906,500	86,875,100	86,385,000
Natural gas	cubic meters	11,600,000	13,100,000	14,700,000	14,400,000	14,494,000
Petroleum:						
Crude:						
In gravimetric units		39,700,000	42,066,700	45,376,300	50,671,500	55,305,000
In volumetric units[e]	42-gallon barrels	292,000,000	309,000,000	334,000,000	373,000,000	406,500,000
Refinery products		NA	NA	8,750,000 e	9,390,000	11,170,000
Uranium:						
U content		2,050	2,800	3,300 r	3,719 r	4,357
U_3O_8 content		2,418	3,302	3,892 r	4,386 r	5,138

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available. -- Zero.
[1]Table includes data available through November 2006.
[2]Reported figure.

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TABLE 32
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina	Pavlodar aluminum plant	Pavlodar	1,250,000
Arsenic trioxide	Chimkent polymetallic enterprise and other nonferrous metallurgical enterprises	Shymkent	3,500
Asbestos	Facilities:		1,000,000 [3]
	Dzhetygara complex	Qostanay	
	Chilisay complex	Aqtobe phosphorite basin	
Barite	Facilities:		300,000 [3]
	Karagaylinskiy and Zhayrem mining and beneficiation complexes	Karagayly, Zhayrem deposit	
	Tujuk Mine	Almaty	
	Achisay polymetallic complex	Kentau Region	
Bauxite	Turgay and Krasno-oktyabrsky bauxite mining complexes	Central Kazakhstan	5,000,000
Beryllium, metal	Ul'ba metallurgical plant	Oskemen	NA
Bismuth, metal	Facilities:		70 [3]
	Ust-Kamenogorsk lead-zinc metallurgical plant	Oskemen	
	Leninogorsk lead smelter	Leninogorsk	
Do.	Chimkent refinery	Shymkent	20
Cadmium	do.	do.	10
Do.	Leninogorsk mining-beneficiation complex	Leninogorsk	1,200
Chromite, mine output, Cr_2O_3 content (50%)	Donskoy GOK mining-beneficiation complex	Near Khromtau, Kempirsai Region	5,000,000
Coal	Karaganda Basin	Central and north-central parts of the country	50,000,000
Do.	Ekibastuz Basin	do.	85,000,000
Do.	Maykuben Basin	do.	10,000,000
Do.	Turgay Basin	do.	1,000,000
Copper:	Kazakhmys PLC mines:		
Mining, recoverable, Cu content	Balkhash complex:		
Do.	Kounrad Mine	South Central Kazakhstan	11,800
Do.	Sayak Mine	do.	23,500
Do.	Shatyrkul Mine	do.	12,700
Do.	East Region:		
Do.	Artemyevskoe Mine	East Kazakhstan	7,820
Do.	Belousovskoe Mine	do.	2,700
Do.	Irtyshskoe Mine	do.	5,750
Do.	Nikolaevskoe Mine	do.	25,700
Do.	Orlovskoe Mine	do.	86,200
Do.	Yubileyno-Snegirikhinskoe Mine	do.	14,200
Do.	Karaganda Region:		
Do.	Abyz Mine	North Central Kazakhstan	5,710
Do.	Nurkazgan Mine	do.	1,190
Do.	Zhezkazgan complex:		
Do.	Annensky Mine	do.	6,630
Do.	East Mine	do.	65,800
Do.	North Mine	do.	32,500
Do.	South Mine	do.	71,600
Do.	Stepnoy Mine	do.	31,700
Do.	West Mine	do.	23,300
Do.	Kazzinc JSC:		
Do.	Ridder:		
Do.	Ridder-Sokolny Mine	East Kazakhstan	NA
Do.	Shubinsky Mine	do.	2,750
Do.	Tishinsky Mine	do.	15,000
Do.	Zyrianovsk: Maleevsky Mine	do.	62,100

See footnotes at end of table.

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TABLE 32—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Copper—Continued:	Kazakhmys PLC mines or plants:		
Processing, recoverable, Cu content	Balkhash complex: Balkhash concentrator	South Central Kazakhstan	39,500
Do.	East Region:		
Do.	Belousovskoe Mine	East Kazakhstan	2,100
Do.	Irtyshskoe Mine	do.	3,890
Do.	Nikolaevskoe Mine	do.	21,200
Do.	Orlovskoe Mine	do.	77,800
Do.	Karaganda Region: Abyz Mine	North Central Kazakhstan	4,000
Do.	Zhezkazgan complex:		
Do.	Stepnoy Mine	do.	58,200
Do.	Zhezkazgan concentrator:		
Do.	Number 1	do.	88,800
Do.	Number 2	do.	111,000
Do.	Kazzinc JSC:		
Do.	Ridder: Ridder concentrator	East Kazakhstan	NA
Do.	Zyrianovsk: Zyrianovsk concentrator	do.	1,200
Metal	Kazakhmys PLC mines or plants:		
Do.	Balkhash complex:		
Do.	Balkhash smelter	South Central Kazakhstan	250,000
Do.	Balkhash refinery	do.	250,000
Do.	Zhezkazgan complex:		
Do.	Zhezkazgan smelter	North Central Kazakhstan	215,000
Do.	Zhezkazgan refinery	do.	250,000
Do.	Kazzinc JSC: Ust-Kamenogorsk: Lead smelter	Oskemen	8,400
Ferroalloys:			
Ferrochrome:			
High-carbon 60%	Aktyubinsk plant	Aqtobe	200,000
Medium-carbon 60%	do.	do.	200,000
Do.	Aksu plant	Aksu	200,000
Ferrosilicon	do.	do.	700,000
Ferrosilicochrome	do.	do.	700,000
Ferrochrome, high-carbon	do.	do.	500,000
Silicomanganese	do.	do.	90,000
Gallium	Pavlodar aluminum plant	Pavlodar	NA
Gold	Byproduct of polymetallic ores and native gold mining	NA	30
Iron and steel:			
Pig iron	Ispat-Karmet Steelworks	Karaganda	5,000,000
Steel, crude	do.	do.	6,300,000
Iron ore, marketable	Lisakovskiy and Sokolovsko-Sarbay mining and metallurgical complexes	Qostanay	25,000,000
Lead:	Kazzinc JSC:		
Mining, recoverable Pb content of ore	Ridder:		
Do.	Shubinsky Mine	East Kazakhstan	461
Do.	Tishinsky Mine	do.	15,000
Do.	Zyrianovsk:	do.	
Do.	Grekhovsky Mine		240,000
Do.	Maleevsky Mine	do.	35,100
Processing, recoverable Pb content of ore	Kazzinc JSC: Ridder: Ridder concentrator	do.	NA
Metal	Chimkent refinery	Shymkent	NA
Do.	Kazzinc JSC: Ust-Kamenogorsk: Lead smelter	Oskemen	168,000
Magnesium, metal	Ust-Kamenogorsk titanium-magnesium plant	do.	20,000
Manganese, crude ore	Facilities:		2,550,000 [3]
	Atasurda	Atasu	
	Kazakmarganets	Zhezdy	
	Sary-Arkapolimetal	Zhayrang Region	

See footnotes at end of table.

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TABLE 32—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Molybdenum:		Facilities:		6,000 [3]
Mining, recoverable content of ore		Balkhash complex	Kounrad Mine	
		Karaobinskoye deposit	Karaoba Region	
		Sayak deposit	Sayaq (Sayak) Region	
Metal		Akchatau molybdenum metal plant	Zhezkazgan Region	NA
Natural gas	million cubic meters	Facilities:		16,000 [3]
		Aktyubinskmunaigaz	Aqtobe	
		Embamunaigaz	Emba District	
		Huricane Kumkol Munai	Aral Sea Region	
		Karachaganak field	Northwestern Kazakhstan	
		Mangistaumunaigaz	Mangghhyshlaq Peninsula	
		Tengizchevroil joint venture	Tengiz deposit	
			Zhanazhol deposit	
			Urikhtau deposit	
		Agip Kazakhstan North Caspian Operating Company (AGip KCO)	Kashagana offshore field	
		Uzenmunaigaz	Uzen deposit	
Petroleum:		Facilities:		32,000,000 [3]
Crude		Aktyubinskmunaigaz	Aqtobe	
		Embamunaigaz	Emba District	
		Huricane Kumkol Munai	Aral Sea Region	
		Karachaganak Integrated Organization (KIO)	Karachaganak field	
		Mangistaumunaigaz	Mangghhyshlaq Peninsula	
		Uzenmunaigaz	Uzen deposit	
Do.		Alibekmola, Ayrankul, Chinarevskoye, Kozhasay, North Buzachi, Sazankurak, Saztyube, and Urikhtau deposits	NA	NA
Do.	24-gallon barrels/day	Tengizchevroil joint venture	Tengiz deposit	750,000
Do.	do.	Agip Kazakhstan North Caspian Operating Company (AGip KCO)	Kashagana offshore field	100,000
Refined, crude oil throughput	do.	Atyrau Pavlodar, Shymkent refineries	Atyrau, Pavlodar, Shymkent, respectively	427,000 [3]
Phosphate rock		Chilisay mining directorate	Aqtobe phosphorite basin	10,000,000 [3]
		Karatau production association	Shymkent and Zhambyl Regions	
Rare metals (columbium, indium, selenium, tellurium)		Aktau complex	Aktau	NA
Do.		Belogorsky rare metals plant	Belogorskiy	NA
Do.		Shymkent polymetallic plant	Shymkent	NA
Do.		Ust-Kamenogorsk lead-zinc plant	Oskemen	NA
Do.		Akchatau mining-beneficiation complex	Zhezkazgan Region	NA
Rhenium		Balkhash copper mining-metallurgical complex	do.	NA
Silver, refined		Facilities:		1,000 [3]
		Chimkent metallurgical plants	Shymkent	
		Leninogorsk	Leninogorsk	
		Ust-Kamenogorsk	Zhezkazgan Region	
Tantalum		Yermak ferroalloy plant	Aksu	NA
Tin		Akchatau mining-beneficiation complex	Akzhaik deposit, Zhezkazgan Region	700
Titanium, metal		Ust-Kamenogorsk titanium-magnesium plant	Oskemen	35,000
Uranium, U content		Facilities:		3,700 [3]
		Prikaspiskiy ore enrichment center	Aqtau	
		Shevchenko	do.	
		Stepnogorsk	Stepnogorsk	
		Taboshara	Taboshara	
		Tselinny chemical complex	Stepnogorsk	

See footnotes at end of table.

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TABLE 32—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Zinc:	Kazakhmys PLC mines:		
Mining, recoverable, Zn content	East Region:		
Do.	Artemyevskoe Mine	East Kazakhstan	30,200
Do.	Belousovskoe Mine	do.	8,420
Do.	Irtyshskoe Mine	do.	14,700
Do.	Nikolaevskoe Mine	do.	48,700
Do.	Orlovskoe Mine	East Kazakhstan	78,200
Do.	Yubileyno-Snegirikhinskoe Mine	do.	16,500
Do.	Karaganda Region: Abyz Mine	North Central Kazakhstan	20,800
Do.	Kazzinc JSC:		
Do.	Ridder:		
Do.	Ridder-Sokolny Mine	East Kazakhstan	NA
Do.	Shubinsky Mine	do.	2,510
Do.	Tishinsky Mine	do.	79,500
Do.	Shaimerden deposit	North Kazakhstan	1,090,000
Do.	Zyrianovsk:		
Do.	Grekhovsky Mine	East Kazakhstan	240,000
Do.	Maleevsky Mine	do.	203,000
Processing, recoverable, Zn content	Kazakhmys PLC mines:		
Do.	East Region:		
Do.	Artemyevskoe Mine	do.	8,580
Do.	Belousovskoe Mine	do.	5,760
Do.	Irtyshskoe Mine	do.	7,610
Do.	Nikolaevskoe Mine	do.	24,200
Do.	Orlovskoe Mine	do.	55,000
Do.	Yubileyno-Snegirikhinskoe Mine	do.	6,190
Do.	Kazzinc JSC:		
Do.	Ridder: Ridder concentrator	do.	NA
Do.	Shaimerden deposit	North Kazakhstan	72,000
Metal	Kazzinc JSC:		
Do.	Ridder: Ridder zinc refinery	East Kazakhstan	126,000
Do.	Ust-Kamenogorsk: Zinc refinery	North Kazakhstan	216,000

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

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TABLE 33

KAZAKHSTAN: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Mineral fuels, mineral oils and products of their distillation:	19,525,360,340	100.00
Of which:		
Switzerland	5,244,294,000	26.86
Italy	3,305,148,691	16.93
France	2,645,480,000	13.55
Iron and steel:	2,244,466,076	100.00
Of which:		
China	498,392,107	22.21
Netherlands	425,926,461	18.98
Russia	305,482,140	13.61
Iran	264,237,864	11.77
Korea, Republic of	125,957,557	5.61
Japan	115,326,770	5.14
Copper and articles thereof:	1,507,500,359	100.00
Of which:		
Italy	804,449,499	53.36
China	569,473,438	37.78
Germany	79,173,634	5.25
Ores, slag and ash:	925,584,480	100.00
Of which:		
Russia	717,465,119	77.51
China	185,728,767	20.07
IMPORTS		
Mineral fuels, mineral oils and products of their distillation:	2,062,331,016	100.00
Of which:		
Russia	1,725,855,627	83.68
Uzbekistan	142,763,108	6.92
Articles of iron or steel:	1,565,881,428	100.00
Of which:		
Russia	523,037,933	33.40
Ukraine	199,742,137	12.76
China	199,334,210	12.73
Japan	112,673,083	7.20
Italy	81,767,851	5.22

[1]Commodity groups are in order by value.

[2]Export and import country percentages may not add to 100%.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 34
KAZAKHSTAN: MAJOR MINERAL RESOURCES[1]

(Thousand metric tons unless otherwise specified)

Reserves[2]		Quantity	World ranking
Chromite		350,000	1
Copper		40,000	4
Gold		1.9	9
Iron ore		17,000,000	7
Lead		4,800	1
Natural gas	million cubic meters	1,830	15
Oil		2,700,000	7
Uranium		900	2
Zinc		34,000	1

[1]Reserve data reported from Kazakhstan does not necessarily conform to reserve data reported by the U.S. Geological Survey or other sources owing to differences in the systems for reporting reserves.
[2]Reported as known reserves.

Source: Dzhakizhev, Moukhtar, 2004, World Nuclear Association Annual Symposium, September 8-10, London, World Nuclear Association 2004, Uranium production in Kazakhstan as a potential source for covering the world uranium shortage.

TABLE 35
KYRGYZSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Antimony:						
Mine output, Sb content[e]		150	150	40	20	10
Metal and compounds		1,050	1,504	1,500	1,000	500
Gold[e]	kilograms	24,000	17,000	22,476 [2]	22,000	16,700
Mercury:						
Mine output, Hg content[e]		300	425	370	488	200
Metal		579	537	500	500	250
Molybdenum, mine output, Hg content[e]		250	250	250	250	250
Tin, mine output, Sn content[e]		300	300	--	--	--
INDUSTRIAL MINERALS						
Cement		468,900	532,800	757,000	800,000 [e]	975,100
Fluorspar, concentrate[e]		1,175 [2]	2,750	3,973 [2]	4,000	4,000
Kaolin		NA	237,100	381,100	400,000 [e]	400,000 [e]
Lime, dead-burned		9,400	9,300	8,700	11,200	9,500
Rare earths:						
Concentrate, gross weight		7,700	700	NA	NA	NA
Rare earth oxide equivalent:						
Compounds		NA	NA	NA	NA	NA
Metals		3,800 [e]	100 [e]	NA	NA	NA
Other[e]		2,000	2,000	2,000	NA	NA
Salt		NA	770	1,100	1,100 [e]	1,100 [e]
MINERAL FUELS AND RELATED MATERIALS						
Coal		477,300	497,500	411,300	454,900	318,000
Natural gas	million cubic meters	33	29	27	29	25
Petroleum, crude	thousand metric tons	75,500	75,500	68,500	73,800	74,400

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA Not available. -- Zero.
[1]Table includes data available through November 2006.
[2]Reported figure.

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TABLE 36
KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Antimony:			
Sb content of ore	Kadamzhai and Khaidarkan complexes	Kadamzhaiskiy Rayon, Khaidarkan Region	2,400 [3]
Ore	Kadamzhai beneficiation plant	Kadamzhai deposit	200,000
Do.	Terek-Sayskiy beneficiation plant	Terek-Sayskiy deposit	60,000
Metal and compounds	Kadamzhai metallurgical facility	Kadamzhaiskiy Rayon	28,000
Cement	Kantskiy cement plant	Kant	1,500,000
Coal	Seven underground mines, five open pits includes deposits: Almalyk, Dzhergalan, Kara-Kiche-Kok-Yangak, Kyzyl-Kiya, Sulyukta, and Tashkumyr	Southwestern, central, and northeastern parts of the country	2,200,000 [3]
Fluorspar, concentrate	Khaidarkan mining-metallurgical complex	Khaidarkan deposit	5,000
Gold:			
Au content of ore	Makmalzoloto	Makmal deposit	3
Do.	Kumtor Gold Company	Kumtor deposit	22
Do. kilograms	Solton-Sary Mine	Naryn	500
Do.	Taldybulak Levoberezhny deposit	NA	NA
Do.	Talas Gold	Jerooy, Talas Region	NA
Au content of ore, open pit	Kyrgyzaltyn-Noroks Mining Company JV	Dzher-Uy deposit	650,000
Au content of ore, underground	do.	do.	350,000
Refined	Kara-Balta refinery	Chuskaya Oblast'	22
Mercury:			
Hg content of ore	Khaidarkan mining-metallurgical complex	Khaidarkan, Chauvi, Chonkoy, and Novoye deposits	700 [3]
Metal	do.	do.	1,000
Molybdenum, for nonmetallurgical uses	Molibden Joint Stock Company	Chuskaya Oblast'	NA
Do.	Kara Balta mining-metallurgical complex	NA	NA
Natural gas million cubic meters	Kyrgyzazmunayzat	Approximately 300 wells; Changyr-Tash, Chigirchik Pereval, Izbaskentskoye, Kara-Agach, Mayluu-Suu, Susahoye, and Togap-Beshkenskoye deposits (major)	100 [3]
Petroleum	do.	do.	150,000
Do.	Kyrgyz Petroleum Company	Dzhalal-Abad Region	NA
Rare earths:			
Concentrates, gross weight	Aktyuzskiy mining directorate	Kutessai II and Aktyuz-Boordu deposits	14,000
Compounds and metals, rare-earth oxide equivalent	Kyrgyz chemical and metallurgical plant	Orlovka	8,000
Silver	Kumyshtag deposit	Talasskaya Oblast'	NA
Do.	Karagoyskoye deposit	Oshskaya Oblast'	NA
Tin	Uchkoshkon deposit	Sary-Dzhas field	NA
Do.	Tyanshanolovo mining-beneficiation complex	do.	NA
Do.	Enil'chek JSC mining enterprise	Atdzhaylau deposit	150
Do.	do.	Trudovoye deposit	350
Tungsten	do.	do.	95,600
Do.	do.	Atdzhaylau deposit	90
Do.	do.	Trudovoye deposit	120
Uranium, processed	Kara-Balta mining-metallurgical complex	Chuskaya Oblast'	1,200

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

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TABLE 37
KYRGYZSTAN: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Country and commodity[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Natural or cultured pearls, precious or semiprecious stones:	236,199,060	100.0
Of which:		
United Arab Emirates	168,287,076	71.25
Swtizerland	65,204,895	27.61
Mineral fuels, mineral oils and products of their distillation:	78,792,835	100.00
Of which:		
Canada	18,519,970	23.50
Russia	15,474,342	19.64
Kazakhstan	12,924,696	16.40
Afghanistan	9,237,713	11.72
Turkey	5,342,453	6.78
United Arab Emirates	4,268,154	5.42
Antimony, of which China	48,000	100.00
Mercury:	3,263,388 [3]	100.00
Of which:		
China	2,835,709 [3]	86.89
Netherlands	427,679 [3]	13.11
IMPORTS		
Mineral fuels, mineral oils, and products of their distillation:	320,186,556	100.00
Of which:		
Russia	188,212,833	58.78
Kazakhstan	75,486,014	23.58
Uzbekistan	35,796,362	11.18

[1]Commodity groups are in order by value.
[2]Export and import country percentages may not add to 100 percent.
[3]Data are for exports in 2004 only; 2005 data were unavailable.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 38
MOLDOVA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity	2001	2002	2003	2004	2005
Metals, crude steel	966,000	514,000	886,000 r	1,012,600 r	1,000,000 e
INDUSTRIAL MINERALS					
Cement	158,100 r	279,000 r	255,400	439,700	500,000 e
Gypsum	55,200 r	91,300 r	116,100	102,500 r	110,000
Lime	3,300 r	3,300 r	2,880	1,911	1,900
Sand and gravel e	306,600 [2]	300,000 [2]	300,000	300,000	300,000
Mineral fuels and related materials, peat e	475,000	475,000	475,000	475,000	475,000

eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. rRevised.
[1]Table includes data available through November 2006.
[2]Reported figure.

TABLE 39
MOLDOVA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity e
Oil and natural gas:				
Oil		Redeco Moldova oil and gas company	Valeni oilfield	100,000
Natural gas	thousand cubic meters	do.	Victorovca gasfield	5,000
Steel, crude		Moldova Steel Works minimill	Ribnita, Transnistria Region	1,100,000

eEstimated; estimated data are rounded to no more than three significant digits.
[1]Table includes data available through December 2006.
[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

TABLE 40
MOLDOVA: MAJOR EXPORTS OF MINERAL COMMODITIES IN 2005

Country and commodity[1]	Value (dollars)	Percentage of total value[2]
Mineral fuels, mineral oils and products of their distillation:	1,649,374	100.00
Of which:		
Canada	1,396,034	84.64
Russia	203,916	12.36
Iron and steel:		
Steel, primary forms, of Romania	44,498	100.00
Semimanufactures, flat-rolled products:	61,219	100.00
Of which:		
Romania	31,964	52.21
United Kingdom	29,255	47.79

[1]Commodity groups are in order by value.
[2]Export country percentages may not add to 100 percent.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed at URL http://unstats.un.org/unsd/comtrade.

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TABLE 41
RUSSIA: STRUCTURE OF INVESTMENT IN 2005

Sector	Value (billion dollars)[1]	Percentage of total investment
Agriculture	3.4	3.2
Construction	3.2	2.9
Education	1.9	1.8
Fishing	0.1	0.1
Government	2.0	1.8
Health care and social services	2.5	2.3
Hotels and restaurants	0.3	0.3
Manufacturing:	18.9	17.6
Of which:		
Coke	0.2	0.2
Nonmetallic mineral products	1.6	1.5
Refinery products	1.7	1.6
Metallurgy and metal goods:	5.0	4.7
Of which:		
Machinery and equipment	0.6	0.5
Metal goods	0.3	0.3
Metallurgy	4.7	4.4
Transportation equip ment	1.1	1.0
Other production	0.7	0.7
Mineral extraction:	16.4	15.2
Of which:		
Fuel	14.5	13.5
Nonfuel	1.9	1.7
Of which, nonmetallic ore	1.1	1.0
Production and distribution of electricity, gas, and hot water	8.4	7.8
Transport and communication	30.9	28.8
Other person needs, including culture and recreation	1.4	1.3
Total	107.5	100.0
Of which, foreign investment	5.2	4.8

[1]One U.S. dollar equals 25 rubles.

TABLE 42
RUSSIA: NEW CAPACITY PUT INTO OPERATION IN THE MINERAL SECTOR AS A RESULT OF NEW CONSTRUCTION, RENOVATION, OR REEQUIPPING

(Thousand metric tons unless otherwise specified)

Commodity and/or mineral sector		2004	2005
Cement		40	35
Coal mining		19,502	2,500
Coal preparation		700	10,500
Gas wells		225	24
Gold-bearing ore		805	50
Iron ore concentrate		63	1,050
Iron ore mining		600	1,250
Oil wells	units	3,000	2,163
Pipelines:			
Crude oil	kilometers	1,350	186.6
Gas, mainline and branch	do.	1,487.6	1,976.7
Oil product, mainline and regional	do.	32.2	28
Salt mining		NA	1,310
Sulfuric acid		260	603

NA Not available.

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TABLE 43
RUSSIA: CONCENTRATION OF RUSSIAN MINERAL ENTERPRISES IN 2004

Commodity	Number of major enterprises	Share of major enterprises in total production, percent
Barite	3	100
Bauxite	1	70
Boron	1	100
Chromite	2	76
Coal	90	81
Copper	9	100
Diamond	2	100
Fluorspar	1	84
Gold:		
Alluvial	18	31
Vein	6	72
Graphite	2	100
Iron ore	5	73
Kaolin	9	100
Lead	2	73
Magnesium carbonate	1	92
Manganese ore	1	79
Molybdenum	1	73
Natural gas	1	90
Nickel	1	more than 90
Oil	9	81
Phosphate	3	100
Platinum-group metals	1	more than 90
Potash	2	100
Salt	5	88
Tin	1	90
Tungsten	2	65
Uranium	1	97
Vanadium	1	95
Zinc	5	84

Source: Trutnev, Yury, 2005, Nadezhnaya osnava dlya razvitiya strang [A hopeful basis for the country's development]: Metally Evrazii, No. 2, p. 9.

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TABLE 44
RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Ore and concentrate:						
Alumina	thousand metric tons	3,046	3,131	3,230	3,269 r	3,259
Bauxite		4,955,000	4,586,000	5,442,000	6,000,000 r, e	6,400,000 e
Nepheline concentrate, 25% to 30%		960,000	1,022,000	1,014,000	1,000,000 e	1,000,000 e
Metal, smelter, primary		3,300,000 e	3,347,413	3,478,057	3,591,747 r	3,647,072
Antimony, mine output, recoverable Sb content e		4,500	1,000 r	2,000 r	3,000 r	3,000
Arsenic, white e		1,500	1,500	1,500	1,500	1,500
Bismuth: e						
Mine output, Bi content		50	50	50	50	50
Metal, refined		10	10	10	10	10
Cadmium, metal, smelter e		950	950	950	950	1,000
Chromium, chrome ore, marketable		69,926	74,300	116,455	320,200	772,000
Cobalt: e						
Mine output, recoverable Co content		4,600	4,600	4,800	4,700	5,000
Metal, refined		5,000	5,100	5,500	5,400	5,800
Copper:						
Ore, recoverable Cu content e		600,000	695,000	675,000	675,000	700,000
Metal:						
Blister, smelter: e						
Primary		650,000	660,000	670,000	662,000	686,000
Secondary		245,000	200,000	170,000	257,000	272,000
Total		895,000	860,000	840,000	919,000 2	958,000
Refined:						
Primary		650,000	670,000 e	670,000 e	662,000	664,000
Secondary		244,500	200,000 e	170,000 e	257,000	269,000
Total		894,500	870,000 e	840,000 e	919,000	933,000
Gold:						
Mine output, Au content	kilograms	152,500	168,411	170,068	163,148 r	169,297
Secondary recovery	do.	1,814 r	2,493 r	6,835	4,844 r	4,884
Iron and steel:						
Iron ore:						
Gross weight		82,500,000	84,236,400	91,759,800	96,980,000	96,764,400
Fe content, 55% to 63% e		48,000,000	49,000,000 2	53,000,000	56,200,000	56,100,000
Metal:						
Pig iron		44,980,000	46,060,000	48,368,000	50,426,700 r	48,419,000
Direct-reduced iron		2,510,000	2,910,000	2,900,000	3,140,000 r, e	3,340,000 e
Ferroalloys: e						
Blast furnace:						
Ferromanganese		55,000	105,000	101,000	108,000	108,000
Ferrophosphorus		3,500	3,500	3,500	3,500	3,500
Spiegeleisen		7,000	7,000	7,000	7,000	7,000
Electric furnace:						
Ferrochromium		210,600 2	210,000 2	357,000 2	453,700 2	578,000 2
Ferrochromiumsilicon		4,000	4,000	4,000	4,000	4,000
Ferronickel		30,000 2	45,000	51,000	53,000	53,000
Ferrosilicon		707,100 2	701,000	760,000	720,000	742,000 2
Ferrovanadium		18,800	15,100	8,000	13,090 2	12,880 2
Silicomanganese		124,000	127,000	83,000	143,000	145,000
Silicon metal		70,000	70,000	85,000	85,000	45,000
Other		16,200	14,900	22,000	22,000	22,000
Total		1,250,000	1,300,000	1,480,000	1,610,000	1,720,000
Steel:						
Crude		59,029,700	59,776,600	62,707,600	65,645,600 r	66,186,200
Finished, rolled		47,100,000	48,700,000	51,050,000	53,800,000	54,600,000
Pipe		5,409,900	5,115,200	6,102,000	5,990,000	6,673,000

See footnotes at end of table.

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TABLE 44—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS—Continued						
Lead:[e]						
Mine output, recoverable Pb content		12,300	19,000	24,000	23,000 r	36,000
Metal, refined, primary and secondary		67,500	60,350 2	66,000	70,000 r	66,000
Magnesium:[e]						
Magnesite		1,000,000	1,000,000	1,200,000	1,200,000	1,200,000
Metal, including secondary		40,000 r	40,000 r	43,000 r	45,000 r	45,000
Manganese ore:[e]						
Gross weight		115,000	115,000	115,000	115,000	115,000
Mn content		23,000	23,000	23,000	23,000	23,000
Mercury[e]		50	50	50	50	50
Molybdenum[e]		2,600	2,900	2,900	2,900	2,900
Nickel:[e]						
Mine output, recoverable Ni content		320,000	310,000 r	300,000 r	315,000	315,000
Matte, for export		--	7,783	3,866	599	600
Nickel products:						
Ferronickel, Ni content		8,000	12,000	13,500	14,000	13,000
Metal		252,000 r	239,000 r	260,000 r	261,000 r	266,000
Oxide sinter		12,000	6,000	5,000	5,000	5,000
Chemicals		2,000	2,000	2,500	3,000	3,000
Total		274,000 r	259,000 r	281,000 r	283,000 r	287,000
Platinum-group metals:[e]						
Platinum	kilograms	27,000	27,000	28,000	28,000	30,000
Palladium	do.	96,000	96,000	97,000	97,000	97,400
Other	do.	14,500	14,500	15,000	15,000	15,500
Total	do.	138,000	138,000	140,000	140,000	143,000
Rhenium[e]	do.	1,200	1,400	1,400	1,400	1,400
Silicon[e]		NA	NA	570,000 r	550,000	525,000
Silver[e]						
Mine output, Ag content	kilograms	380,000	400,000 r	700,000 r	1,276,900 r, 2	1,350,000 2
Secondary recovery[e]	do.	250	250	250	265	265
Tin:[e]						
Mine output, recoverable Sn content		2,000	1,300	2,000	2,500	3,000
Metal, smelter:						
Primary		4,569 2	4,615 2	4,100 r	4,570 r	4,700
Secondary		500	500	500	500	600
Total		5,070	5,120	4,600 r	5,070 r	5,300
Titanium sponge[e]		22,000	22,000	23,000 r	23,000 r	25,000
Tungsten, concentrate, W content[e]		5,100 r	5,300 r	5,450 r	5,500 r	600
Vanadium, metal[e]		7,500 r	8,000	5,800	10,900 r	15,100
Zinc:[e]						
Mine output, recoverable Zn content		124,000	130,000 2	159,000	179,000	180,000
Metal, smelter, primary and secondary		237,000	244,000	253,000	240,000	220,000
Zirconium, baddeleyite concentrate, averaging 98% ZrO_2[e]		6,500	6,500	6,500	6,500	6,500
INDUSTRIAL MINERALS						
Asbestos, grades I-VI[e]		750,000	775,000	878,000 2	923,000 2	925,000
Barite[e]		64,000 r	59,000 r	78,000 r	63,000 r	63,000
Boron[e]	thousand metric tons	1,000	1,000	1,000	500	400
Cement, hydraulic		35,300,000	37,700,000	41,000,000	45,700,000 r	48,700,000
Clays, kaolin concentrate[e]		45,000	45,000 2	45,000	45,000	45,000
Diamonds:[e]						
Gem	carats	17,500,000	17,400,000	20,000,000	21,400,000	23,000,000
Industrial	do.	11,700,000	11,600,000	13,000,000	14,200,000	15,000,000
Synthetic	do.	80,000,000	80,000,000	80,000,000	80,000,000	80,000,000
Total	do.	109,000,000	109,000,000	113,000,000	116,000,000	118,000,000
Feldspar[e]		45,000	45,000	45,000	45,000	45,000

See footnotes at end of table.

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TABLE 44—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS—Continued						
Fluorspar, concentrate, 55% to 96.4% CaF_2		200,000	169,000	170,000	226,400 r	245,500
Gypsum[e]		1,500,000	1,600,000	1,750,000	2,077,000 [2]	2,200,000
Iodine[e]		300,000	300,000	300,000	300,000	300,000
Lime industrial and construction[e]		8,000,000	8,000,000	8,000,000	8,200,000 [2]	8,200,000
Lithium minerals, unspecified[e]		2,000	2,000	2,000	2,200	2,200
Mica[e]		100,000	100,000	100,000	100,000	100,000
Nitrogen, N content of ammonia		8,690,000	8,600,000 e	9,100,000 e	9,800,000	10,000,000 e
Phosphate rock:[e]						
Gross weight		10,500,000	10,700,000	11,000,000	11,000,000	11,000,000
P_2O_5 content:						
Apatite concentrate, 37% to 39.6%		3,936,000 [2]	4,038,000 [2]	4,121,000 [2]	4,120,000	4,200,000
Sedimentary rock, 19% to 30%		300,000	300,000	300,000	300,000	300,000
Total		4,240,000	4,340,000	4,420,000	4,420,000	4,500,000
Potash, marketable, K_2O equivalent[e]		4,300,000	4,400,000	4,740,000	5,000,000	5,000,000
Salt, all types[e]		2,800,000 [2]	2,800,000	2,800,000	2,800,000	2,800,000
Soda ash[e]		2,370,000	2,400,000	2,400,000	2,600,000	2,600,000
Sulfur:[e]						
Native		50,000	50,000	50,000	50,000	50,000
Pyrites		320,000	350,000	350,000	300,000	300,000
Byproduct:						
Metallurgy		460,000	500,000	520,000	570,000	600,000
Natural gas		5,300,000	5,600,000	5,800,000	6,000,000	6,000,000
Total		6,130,000	6,500,000	6,720,000	6,920,000	6,950,000
Sulfuric acid		8,200,000 r	8,500,000 r	8,800,000 r	9,200,000 r	9,300,000
Talc[e]		100,000	100,000	100,000	100,000	100,000
Vermiculite[e]		25,000	25,000	25,000	25,000	25,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite		9,700,000 r	9,000,000 r	7,900,000 r	7,800,000 r	8,000,000
Bituminous		260,300,000 r	247,000,000 r	269,100,000 r	203,200,000 r	195,000,000
Lignite		83,000,000	74,200,000	79,400,000 r	70,400,000 r	95,000,000
Total		353,000,000 r	330,200,000 r	356,400,000 r	281,400,000 r	298,000,000
Coke, 6% moisture content		29,900,000	30,900,000	32,700,000	33,801,000	31,600,000
Natural gas, marketed	million cubic meters	581,000	595,000	616,450	633,950	635,964
Natural gas plant liquids	42-gallon barrels	86,505,000	89,790,000	142,350,000 r	166,400,000	166,805,000
Oil shale		2,624,000	1,100,000 r	1,240,000	1,230,000	1,200,000
Peat, horticultural use and fuel use		2,800,000 r	2,200,000 r	1,000,000 r	1,500,000 r	1,500,000
Petroleum:						
Crude in:						
Gravimetric units		348,000,000	379,000,000	412,377,000	458,808,000	469,600,000
Volumetric units[e]	thousand 42-gallon barrels	2,560,000	2,790,000	3,000,000	3,300,000	3,500,000
Refinery products[3]		178,362,300	184,960,000	190,030,000	195,000,000	207,000,000
Uranium:						
U content[e]		2,500	2,900	3,150	3,200 r	3,430
U_3O_8 content		2,948	3,420	3,715	3,774 r	4,045

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available. -- Zero.
[1]Table includes data available through November 2006.
[2]Reported figure.
[3]Not distributed by type and therefore not suitable for conversion to volumetric units. Data include all energy and nonenergy products but exclude losses.

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TABLE 45

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina	Achinsk	Achinsk in East Siberia	900,000
Do.	Bogoslovsk	Krasnotur'insk	1,050,000
Do.	Boksitogorsk	European north	200,000
Do.	Pikalyovo	Pikalyovo	300,000
Do.	Uralsk	Kamensk-Uralskiy	536,000
Aluminum, primary smelters	Bogoslovsk	Krasnotur'insk	175,000
Do.	Bratsk	Bratsk	950,000
Do.	Irkutsk	Irkutskaya Oblast'	300,000
Do.	Kandalaksha	Kola Pennisula	75,000
Do.	Krasnoyarsk	Krasnoyarskiy Kray	875,000
Do.	Nadvoitsy	Nadvoitsy in Karelia	75,000
Do.	Novokuznetsk	Novokuznetsk	300,000
Do.	Sayansk	Sayanogorsk	425,000
Do.	Uralsk	Kamensk-Uralskiy	80,000
Do.	Volgograd	Volgogradskaya Oblast'	175,000
Do.	Volkhov	Volkhov, east of St. Petersburg	20,000
Antimony:			
Sb content of concentrate	Sarylakh deposit	Ust'-Nera Region	6,000[3]
Do.	Sentachan deposit	Northeastern Sakha (Yakutiya) Republic	NA
Compounds and metals	Ryazsvetmet plant	Ryazanskaya Oblast'	NA
Apatite, concentrate	Khibiny apatite association	Kola Peninsula	15,000,000
Do.	Kovdor iron ore mining association	do.	700,000
Asbestos	Kiyembay	Orenburgskaya Oblast'	500,000
Do.	Tuvaasbest	Tuva Autonomous Region	250,000
Do.	Uralaasbest	Central Ural Mountains	1,100,000
Bauxite	North-Urals mining company	Severoural'sk Region	NA
Do.	South-Urals mining company	South Ural Mountains	NA
Do.	Severnaya Onega Mine	Northwest Region	800,000
Do.	Komi Aluminum	Sredne-Timan	3,000,000
Boron, boric acid	Bor Association	Maritime Territory	140,000
Do.	Amur River complex	Far East	8,000
Do.	Alga River chemical complex	do.	12,000
Chromite	Saranov complex	Saranovskiy	200,000
Coal	Donets (east) Basin	Rostovskaya Oblast'	30,000,000
Do.	Kansk Achinsk Basin	East Siberia	50,000,000
Do. thousand metric tons	Kuznetsk Basin (Kuzbass)	West Siberia	160,000
Do.	Moscow Basin	Moscow Region	15,000,000
Do.	Neryungri Basin	Sakha (Yakutiya) Republic	15,000,000
Do.	Pechora Basin	Komi Republic	30,000,000
Do.	South Yakutia Basin	Sakha (Yakutiya) Republic	17,000,000
Cobalt:	MMC Noril'sk Nickel	Noril'sk, Kola Peninsula	4,000
Do.	Rezh and Yuzhuralnikel enterprises	South Ural Mountains	2,100
Do.	Ufaleynikel company	Chelyabinsk region, Ural Mountains	1,900
Do.	Tuva cobalt	Khovu-Aksy, Tuva Autonomous Region	NA
Copper:			
Ore	MMC Noril'sk Nickel	Noril'sk region, Kola Peninsula	14,000,000
Do.	Molodezhnyy, Sibay, and Uchali open pits	Urals	NA
Do.	Mednogorsk complex	Aleksandrinskoye deposit	NA
Do.	Gai complex	Letneye deposit	NA
Do.	Rezh nickel plant	Safyanovoskoye deposit	NA
Do.	Udokan deposit	Chita Oblast	10,000,000
Cu content of concentrate	Buribai enterprise	Buribay Region	5,000
Do.	Gai complex	Gai region	40,000

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Copper--Continued:				
Cu content of concentrate--Continued		Kirovgrad complex	Kirovgrad Region	12,000
Do.		Krasnoural'skiy complex	Krasnoural'skiy Region	12,000
Do.		Norilsk complex	Noril'sk region, Kola Peninsula	400,000
Do.		Sredneuralsk complex	Ekatrinenburg Region	12,000
Do.		Uchali complex	Uchalinskiy Rayon	40,000
Do.		Urap complex	Stavropol'skiy Kray	7,000
Metal		Kirovgrad (smelting)	Kirovgrad	150,000
Do.		Krasnoural'skiy (smelting)	Krasnoural'sk	60,000
Do.		Kyshtym (refining)	Kyshtym	70,000
Do.		Mednogorsk (smelting)	Mednogorsk	40,000
Do.		Noril'sk (smelting and refining)	Nori'lsk region	500,000
Do.		Psysh (refining)	Psysh	350,000
Do.		Severonikel (smelting)	Monchegorsk	20,000
Do.		Sredneuralsk (smelting)	Revda	140,000
Diamond, gem and industrial	thousand carats	Almazy Rossii-Sakha Association (Alrosa) enterprises:	Sakha (Yukutiya) Republic mines:	
		Udachnyy mining and beneficiation complex	Zarnitsa and Udachnyy	NA
Do.	do.	Mirny mining and beneficiation complex	Mir and International	NA
Do.	do.	Aikhal mining and beneficiation complex	Aikhal and Komsomol'skiy	NA
Do.	do.	Anabaraskiy mining and beneficiation complex	Alluvial mines	NA
Do.	do.	Nyurbinskiy mining and beneficiation complex	Nyurbinskiy and Botuobinskiy	NA
Do.	do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Feldspar		Kheto-Lanbino and Lupikko deposits	Karelia	NA
Ferroalloys		Kosaya Gora iron works	Kosaya,Gora	200,000
Do.		Kuznetsk ferroalloys plant	Novokuznetsk	400,000
Do.		Lipetsk iron and steel works	Lipetskaya Oblast'	NA
Do.		Serov ferroalloy plant	Serov	NA
Do.		Chelyabinsk electrometallurgical plant	Chelyabinskaya Oblast'	450,000
Do.		Chusovoy iron and steel plant	Chusovoy	NA
Do.		Klyuchevsk ferroalloy plant	Dvurechensk	160,000
Ferronickel		Ufaleynikel company	Chelyabinsk Region, Urals	5,000
Ferrovanadium		Vanadii-Tulachermet	Tula, North Caucasus	NA
Fluorspar		Abagaytuy deposit	Transbaikal	NA
Do.		Usugli Mine	do.	NA
Do.		Kyakhtinsky deposit	do.	NA
Do.		Kalanguy mining complex	Chita Region, Transbaikal	NA
Do.		Yaroslavsky mining-beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Russian Far East's Maritime (Primor'ye) Region	NA
Gold	kilograms	Mining companies:	Mining regions:	
		Amur a/s ZAO	Khabarovsk Kray	5,500
Do.	do.	Buryatzoloto OAO	Buryat Republic	5,000
Do.	do.	Chukotka a/s	Chukotsk Autonomous Oblast'	1,700
Do.	do.	GRK Aldanzoloto OOO	Sakha (Yukutiya) Republic	4,000
Do.	do.	LT-Resurs, ZAO	Irkutsk Oblast'	2,700
Do.	do.	Neryungri-Metallik, OOO	Sakha (Yukutiya) Republic	1,500
Do.	do.	Nirungan, OOO	do.	1,100
Do.	do.	Omchak OAO	Magadan Oblast'	3,000
Do.	do.	Omolonskaya ZRK, OAO	Magadan Oblast'	5,000
Do.	do.	Omsukchanskaya GGK, ZAO	do.	3,000
Do.	do.	Oyna, a/s	Tyva Republic	1,500
Do.	do.	Pokrovskiy Mine OAO	Amur Oblast'	6,000
Do.	do.	Polimetal, MNPO, OAO	Magadan and Sverdlovsk Oblast's, Khabarovsk Kray	7,500
Do.	do.	Polyarnaya, a/s	Chukotsk Autonomous Oblast'	1,000

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
		Mining companies:	Mining regions:	
Gold—Continued	kilograms	Polyus ZAO	Krasnoyarsk Kray	35,000
Do.	do.	Priisk Drazhnyy, OOO	do.	1,200
Do.	do.	Priisk Solov'yevskiy, OAO	Amur Oblast'	1,500
Do.	do.	Ros-DV, OOO	Khabarovsk Kray	1,100
Do.	do.	Russdragmet OOO	Khabarovsk Kray, Chita Oblast'	6,000
Do.	do.	Seligdar, a/s	Sakha (Yukutiya) Republic	2,000
Do.	do.	Sovrudnik, OOO	Krasnoyarsk Kray	2,000
Do.	do.	Susumanzoloto, OAO	Magadan Oblast'	3,000
Do.	do.	Uralelktomed', OAO	Sverdlovsk Oblast'	1,400
Do.	do.	Vitim. a/s	Irkutsk Oblast'	2,900
Do.	do.	Votok, a/s	Khabarovsk Kray	1,100
Do.	do.	Yuzhuralzoloto	Chelyabinsk Oblast'	4,200
Do.	do.	Zapadnaya, a/s	Krasnoyarsk Kray	1,900
Do.	do.	Zolotaya, ZDK, ZAO	Khakasiya Republic	1,200
Iron ore		Kursk Magnetic Anomaly (KMA) region, which contains the following enterprises:		50,000,000[3]
		Lebedi and Stoilo	Gubkin	
		Mikhailovka	Zheleznogorsk	
Do.		Northwest region, which contains the following enterprises:		22,000,000[3]
		Kostomuksha	Kostomuksha	
		Kovdor	Kola Peninsula	
		Olenegorsk	Olenegorsk	
Do.		Siberia region, which contains the following enterprises:		18,000,000[3]
		East:		
		Korshunovo	Zheleznogorsk	
		Rudnogorsk	Rudnogorsk	
		West:		
		Abakan	Abaza	
		Sheregesh	Sheregesh	
		Tashtagol	Tashtagol	
		Teya	Vershina Tei	
Do.		Ural Mountains region, which contains the following enterprises:		22,000,000[3]
		Akkermanovka	Novotroitsk	
		Bakal	Bakal	
		Goroblagodat	Kushva	
		Kachkanar	Kachkanar	
		Magnitogorsk	Magnitogorsk	
		Peshchanka	Rudnichnyy	
Lead-zinc, recoverable content of ore:				
Lead, recoverable Pb content of ore		Altay mining-benefication complex	Altay Mountains region, South Siberia	2,000
Do.		Dalpolymetal mining-benefication complex	Maritime Territory	20,000
Do.		Nerchinsk polymetallic complex	Chitinskaya Oblast'	7,000
Do.		Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	5,000
Do.		Salair mining-benefication complex	Kemerovo Oblast'	2,000
Zinc, recoverable Zn content of ore		Altay mining-benefication complex	Altay Mountains region, South Siberia	1,000
Do.		Dalpolymetal mining-beneficiation complex	Maritime Territory	25,000
Do.		Nerchinsk polymetallic complex	Chitinskaya Oblast'	12,500
Do.		Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	14,000
Do.		Salair mining-benefication complex	Kemerovo Oblast'	10,500

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Lead, metal		Dalpolymetal lead smelter	Rudnaya in the Maritime District	20,000
Do.		Elektrozinc lead smelter	Vladikavkaz in North Caucasus	30,000
Magnesite		Satka deposit	Chelyabinsk Oblast'	3,800,000
Magnesium, metal (for sale)		Avisma plant	Berezniki	35,000
Do.		Solikamsk plant	Solikamsk	30,000
Mica		Aldan	Sakha (Yakutiya) Republic	NA
Do.		Karel	Karelia	NA
Do.		Kovdor	Kola Peninsula	NA
Do.		Mam	Irkutsk complex	NA
Molybdenum		Dzhida tungsten-molybdenum mine	West Transbaikal	NA
Do.		Sorsk molybdenum mining enterprise	Sorsk Region	NA
Do.		Tyrnyauz tungsten-molybdenum mine	North Caucasus	NA
Do.		Shakhtaminskoye molybdenum mining enterprise	Chitinskaya Oblast'	NA
Natural gas	million cubic meters	Komi Republic	Komi Republic	8,000
Do.	do.	Noril'sk area	Noril'sk area	5,500
Do.	do.	North Caucasus	North Caucasus	6,000
Do.	do.	Sakhalin	Far East	2,000
Do.	do.	Tomsk Oblast	West Siberia	500
Do.	do.	Tyumen Oblast including:	do.	575,000[3]
Do.	do.	Medvezhye field	do.	(75,000)
Do.	do.	Urengoi field	do.	(300,000)
Do.	do.	Vyrngapur field	do.	(17,000)
Do.	do.	Yamburg field	do.	(170,000)
Do.	do.	Bovanenko field	Yamal Peninsula	NA
Do.	do.	Pestsovoyy field	Ob-Taz Gulf area	NA
Do.	do.	Zapolyarnyy field	do.	NA
Do.	do.	Schtokmanov field	Barents Sea	NA
Do.	do.	Urals	Ural'skiye Gory	45,000
Do.	do.	Volga	Volga Region	6,000
Do.	do.	Yakut-Sakha	Sakha (Yakutiya) Republic	1,500
Nepheline syenite		Apatite complex	Kola Penisula	1,500,000
Do.		Kiya-Shaltyr Mine	Goryachegorsk Region, east Siberia	NA
Nickel:				
Ni in ore		MMC Noril'sk Nickel	Noril'sk Region, Kola Peninsula	300,000
Do.		Yuzhuralnikel company	South Urals	3,000
Do.		Ufaleynikel company	Chelyabinsk Region, Urals	17,000
Metal:				
Smelting		MMC Norilsk Nickel	Noril'sk region	160,000
Do.		do.	Pechenga	50,000
Do.		do.	Monchegorsk	50,000
Refining		MMC Norilsk Nickel	Noril'sk region	100,000
Do.		do.	Monchegorsk	140,000
Ni products and Ni in FeNi		Rezh, Ufaleynikel, and Yuzhuralnikel enterprises	South Urals	65,000
Oil shale		Leningradslanets Association	Slantsy Region	5,000,000
Petroleum		East Siberia, Tomsk Oblast	Tomskaya Oblast'	11,000,000
Do.		European Russia:		
Do.		Astrakhan	North Caspian Sea basin	700,000
Do.		Bashkortostan	Ural'skiye Gory	28,000,000
Do.		Checheno-Ingush Republic	Southern Caucasus	4,500,000
Do.		Dagestan	North Caucasus	700,000
Do.		Kaliningrad Oblast	Baltic coast	1,800,000
Do.		Komi Republic	Northwest	15,000,000
Do.		Krasnodar Kray	North Caucasus	2,000,000
Do.		Orenburg Oblast	Ural'skiye Gory	13,000,000
Do.		Perm Oblast	do.	12,000,000
Do.		Samara	Volga Region	16,000,000

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Petroleum—Continued		European Russia:		
Do.		Saratov Oblast	Volga Region	1,500,000
Do.		Stavropol Kray	North Caucasus	2,000,000
Do.		Tatarstan	Volga Region	40,000,000
Do.		Udmurt Republic	Ural'skiye Gory	9,000,000
Do.	thousand metric tons	Fields:	Tyumenskaya Oblast', West Siberia	300,000 [4]
Do.	do.	Kogolym	do.	(34,000)
Do.	do.	Krasnoleninskiy	do.	(12,000)
Do.	do.	Langepas	do.	(30,000)
Do.	do.	Megion	do.	(18,000)
Do.	do.	Nizhnevartovsk	do.	(70,000)
Do.	do.	Noyabrsk	do.	(37,000)
Do.	do.	Purneftegaz	do.	(12,000)
Do.	do.	Surgat	do.	(48,000)
Do.	do.	Uray	do.	(8,000)
Do.	do.	Varegan	do.	(10,000)
Do.		Sakhalin Island	Sakhalin Island	2,500,000
Phosphate rock		Kingisepp complex	Leningradskaya Oblast'	NA
Do.		Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.		Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.		Verkhnekamsk deposit	Ural'skiye Gory	NA
Phosphate rock, apatite concentrate		OJSC Apatit	Kola Peninsula	12,000,000
Do.		Kovdor iron mining complex	do.	700,000
Platinum-group metals:				
Ore, PGM content		MMC Noril'sk Nickel	Noril'sk region	150
Do.		AO Koryakgeoldobycha, Amur Prospectors	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10 [3]
Metals		Krasnoyarsk Nonferrous Metals Plant (Krastsvetmet)	Krasnoyarskiy Kray	NA
Do.		Ekaterinburgskiy plant (EZOTsM)	Ekaterinburg	NA
Do.		Priobsk plant	Priobsk	NA
Potash, K_2O equivalent		Uralkaliy	Verkhnekamsk deposit	3,000,000
Do.		Silvinit	Solikamsk-Berezniki regions, Ural'skiye Gory	2,000,000
Silver		Dukat Mine	Magadanskaya Oblast'	1,000
Soda ash		Achinsk plant	East Siberia	595
Do.		Berezniki plant	Ural'skiye Gory	1,080
Do.		Pikalevo plant	Leningradskaya Oblast'	200
Do.		Sterlitamak plant	Sterlitamak	2,135
Do.		Volkhov plant	Leningradskaya Oblast'	20
Steel, crude		Amurstal	Komsomol'sk-na-Amure	1,600,000
Do.		Asha	Asha	450,000
Do.		Beloretsk	Bashkirskoye	380,000
Do.		Chusovoy	Chusovoy	570,000
Do.		Elektrostal	Moscow	314,000
Do.		Gorky	Nizhniy Novgorod	78,000
Do.		Gur'yevsk	Gur'yevsk	160,000
Do.		Karaganda	Karaganda	6,300,000
Do.		Kuznetsk	Novokuznetsk	4,700,000
Do.		Lys'va	Lys'va	350,000
Do.		Magnitogorsk	Magnitogorsk	16,200,000
Do.		Mechel (Chelyabinsk)	Chelyabinskaya Oblast'	7,000,000
Do.		Nizhniy Tagil	Nizhniy Tagil	8,000,000
Do.		Nizhniy Sergi	Nizhniye Sergi	300,000
Do.		Nosta (Orsk-Kahlilovo)	Novotroitsk in Orenburgskaya Oblast'	4,600,000
Do.		Novolipetsk	Lipetskaya Oblast'	9,900,000

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Steel, crude—Continued	Novosibirsk	Novosibirskaya Oblast'	1,100,000
Do.	Omutninsk	Omutninsk	210,000
Do.	Oskol Electric Steel	Staryy Oskol	2,500,000
Do.	Petrovsk-Zabaykal'skiy	Petrovsk-Zabaykal'skiy	426,000
Do.	Revda	Revda	281,000
Do.	Salda	Sverdlovskaya Oblast'	1,900
Do.	Serov A.K.	Serov	1,000,000
Do.	Serp i Molot	Moscow	70,000
Do.	Severskiy	Polevskoy in Sverdlovskaya Oblast'	825,000
Do.	Severstal (Cherepovets)	Cherepovets	14,000,000
Do.	Sibelektrostal	Krasnoyarskiy Kray	110,000
Do.	Sulin	Sulin	280,000
Do.	Taganrog	Taganrog	925,000
Do.	Tulachermet Scientific and Industrial Association	Tula	18,400
Do.	Verkh-Isetskiy	Ekatrinenburg	132,000
Do.	Volgograd	Volgogradskaya Oblast'	2,000,000
Do.	Vyksa	Vyksa	540,000
Do.	West Siberian	Novokuznetsk	6,900,000
Do.	Zlatoust	Zlatoust in Chelyabinskaya Oblast'	1,200,000
Talc	Onotsk deposit	Irkutskaya Oblast'	NA
Do.	Kirgiteysk deposit	Krasnoyarskiy Kray	NA
Do.	Miass deposit	Chelyabinskaya Oblast'	NA
Do.	Shabrovsk deposit	Sverdlovskaya Oblast'	NA
Tin:	Novosibirsk mining-beneficiation complexes:		
Ore	Khinganskoye olovo (Jewish Autonomous District)	Khabarovskiy Kray	NA
Do.	Dalolovo	Solnechnyy deposit, Primor'ye	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha (Yakutiya) Republic	NA
Do.	Vostokolovo	Russian Far East	NA
Do.	Iultin mining-beneficiation complex	Magadanskaya Oblast'	NA
Do.	Khrustalnyy mining-beneficiation complex	Maritime Territory	NA
Do.	Pevek mining-beneficiation complex	Magadanskaya Oblast'	NA
Metal	Novosibirsk smelter	Novosibirskaya Oblast'	NA
Do.	Podol'sk smelter	Podol'sk	NA
Do.	Ryazan smelter	Ryazanskaya Oblast'	NA
Titanium:			
Sponge	Avisma Titanium-Magnesium complex	Berezniki	40,000
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	Verknyaya Salda Metallurgical Production Association (VSMPO)	Sverdlovskaya Oblast', Ural Mountains	NA
Tungsten:			
W content of concentrates	Antonovogorsk	East Transbaikal	NA
Do.	Balkan	Northeast of Magnitogorsk, Ural'skiye Gory	NA
Do.	Belukha	East Transbaikal	NA
Do.	Bom-Grokhom	West Transbaikal	NA
Do.	Dzhida	do.	NA
Do.	Iultin	Magadanskaya Oblast'	NA
Do.	Lermontov	Russian Far East	NA
Do.	Solnechnyy	Southern Khabarovskiy Kray	NA
Do.	Tyrnyauz tungsten-molybdenum mining and processing complex	Kabardino-Balkariya, North Caucasus	NA
Do.	Primorsky	Russian Far East	NA
Do.	Aginskoye deposit	Sakha (Yakutiya) Republic	NA
Do.	Kti-Teberdaskoye deposit	North Caucasus	NA

See footnotes at end of table.

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TABLE 45—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Tungsten, metal, tungsten anhydride	Gidrometallurg plant	Nal'chik, North Caucasus	NA
Uranium, U content	Priargunsky mining and chemical enterprise	Krasnokamensk	3,500
Vanadium:			
Ore	Kachkanar iron mining complex	Ural'skiye Gory	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tula, North Caucasus	NA
Zinc:			
Zn content of ore	Bashkir copper-zinc complex	Sibai, southern Ural Mountains	5,000
Do.	Buribai copper-zinc mining complex	Buribai, southern Ural Mountains	1,500
Do.	Gai copper-zinc mining-beneficiation complex	Gai, southern Ural Mountains	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad, central Ural Mountains	1,200
Do.	Sredneuralsk copper complex	Revda, central Ural Mountains	5,000
Do.	Uchali copper-zinc mining-beneficiation complex	Uchalinskiy Rayon, southern Ural Mountains	90,000
Metal	Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	Elektrozink plant	Vladikavkaz, North Caucasus	100,000

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.
[1]Table includes data and information available through December 2006.
[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.
[3]Capacity estimates are totals for all enterprises that produce that commodity.

TABLE 46
RUSSIA: DOLLAR VALUE OF EXPORTS, BY SECTOR

(Billion dollars)[1]

Sector	1995	2000	2001	2002	2003	2004	2005
Chemical industry products and rubber	6.3	6.0	5.9	5.8	7.0	9.1	11.4
Food and agricultural products (except textiles)	1.0	0.9	1.0	1.6	1.8	1.4	2.3
Leather goods, furs, forestry and paper products	3.9	4.1	4.0	4.4	4.9	6.1	7.2
Machinery, equipment, transport means	5.3	6.7	7.5	7.2	8.0	8.4	7.6
Metals, precious stones and articles thereof	19.5	21.0	17.2	18.3	21.4	33.1	37.0
Mineral products	25.8	48.7	48.3	51.8	67.8	92.0	140.8
Textiles and shoes	0.8	0.5	0.5	0.5	0.5	0.5	0.4
Other	0.8	1.2	0.9	1.2	1.6	1.4	1.8
Total	63.7	89.3	85.4	91.0	113.2	152.2	208.8

[1]One U.S. dollar equals 25 rubles.

Source: Rossiya v Tsifrakh 2006 [Russia in figures 2006], Russian Federal Statistical Service, Moscow.

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TABLE 47
RUSSIA: PERCENTAGE VALUE OF EXPORTS, BY SECTOR

(Percentage of total)

Sector	1995	2000	2001	2002	2003	2004	2005
Chemical industry products and rubber	9.9	6.7	6.9	6.4	6.2	6.0	5.5
Food and agricultural products (except textiles)	1.5	1.0	1.2	1.8	1.5	1.9	1.1
Forestry and paper products	6.1	4.5	4.6	4.8	4.3	4.0	3.4
Leather goods, furs	0.5	0.3	0.2	0.2	0.2	0.2	0.1
Machinery, equipment, transport means	8.3	7.5	8.7	7.0	7.1	5.5	3.6
Metals, precious stones and articles thereof	30.7	23.5	20.2	20.0	18.0	21.8	17.7
Mineral products	40.4	54.5	56.5	56.0	60.0	60.4	67.5
Textiles and shoes	1.3	0.6	0.6	0.6	0.5	0.3	0.2
Other	1.3	1.4	1.1	1.4	1.3	0.9	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Rossiya v Tsifrakh 2006 [Russia in figures 2006], Russian Federal Statistical Service, Moscow.

TABLE 48
RUSSIA: MAJOR EXPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
Mineral fuels, mineral oils and products of their distillation:	118,241,498,233	100.00
Of which:		
Netherlands	19,632,215,567	16.60
Italy	12,557,053,984	10.62
Germany	9,843,798,905	8.33
Poland	6,433,288,970	5.44
Iron and steel:	17,875,173,785	100.00
Of which:		
Turkey	2,013,346,640	11.26
China	1,519,124,264	8.50
United States	1,324,699,277	7.41
Italy	1,293,186,409	7.23
Iran	1,238,829,986	6.93
Unspecified Asia	1,086,428,092	6.08
Aluminum and articles thereof:	5,735,996,821	100.00
Of which:		
Portugal	1,301,420,479	22.69
Japan	1,264,951,431	22.05
United States	1,001,626,626	17.46
Netherlands	528,277,323	9.21
Germany	303,658,667	5.29

[1]Commodity groups are in order by value.
[2]Export country percentages may not add to 100 percent.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed via URL http://unstats.un.org/unsd/comtrade.

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TABLE 49
RUSSIA: QUANTITY OF MAJOR MINERAL COMMODITY EXPORTS

(Million metric tons unless otherwise specified)

Commodity		1995	2000	2001	2002	2003	2004	2005
Aluminum, metal[1]		2.3	3.2	3.1	2.8	3.1	3.4	3.8
Coal, bituminous:								
Outside the CIS		21.2	38.0	36.0	39.1	51.1	62.6	71.5
Inside the CIS		8.3	6.1	5.5	4.4	9.6	9.4	8.3
Total		29.5	44.1	41.5	43.5	60.7	72.0	79.8
Copper, refined[1]	thousand metric tons	467.0	646.0	595.0	515.0	407.0	337.0	308.0
Ferrous metals	billion dollars	6.8	6.1	5.2	6.1	7.8	15.1	16.4
Iron ore and concentrates:								
Outside the CIS		11.4	9.1	7.6	8.1	9.1	13.8	15.6
Inside the CIS		2.5	10.1	9.4	5.0	7.5	3.2	2.6
Total		13.9	19.2	17.0	13.1	16.6	17.0	18.2
Mineral fertilizers:								
Outside the CIS		6.20	19.9	21.0	20.4	21.8	24.0	25.5
Inside the CIS		0.07	0.4	0.7	1.0	9.0	9.0	8.0
Total		6.27	20.3	21.7	21.4	30.8	33.0	33.5
Natural gas:								
Outside the CIS	billion cubic meters	123.0	134.0	132.0	134.0	142.0	145.0	160.0
Inside the CIS	do.	57.3	60.0	49.2	51.3	47.3	55.1	47.5
Total	do.	180.3	194.0	181.2	185.3	189.3	200.1	207.5
Nickel, metal[1]		153.0	197.0	189.0	381.0	238.0	251.0	261.0
Oil, crude:								
Outside the CIS		100.0	128.0	138.0	157.0	186.0	228.8	214.0
Inside the CIS		15.6	16.9	23.8	33.0	37.0	40.1	38.0
Total		115.6	144.9	161.8	190.0	223.0	268.9	252.0
Oil products, refined:								
Outside the CIS		43.5	59.2	61.0	72.9	74.2	78.5	93.1
Inside the CIS		3.0	3.5	2.5	2.6	3.5	4.1	3.9
Total		46.5	62.7	63.5	75.5	77.7	82.6	97.0
Pig iron:								
Outside the CIS		2.80	3.6	3.4	3.9	4.4	5.1	4.9
Inside the CIS		0.03	0.1	0.2	0.3	0.4	0.4	0.4
Total		2.83	3.7	3.6	4.2	4.8	5.5	5.3

[1]No exports reported outside the Commonwealth of independent States (CIS).

Source: Rossiya v Tsifrakh 2006 (Russia in figures 2006), Russian Federal Statistical Service, Moscow.

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TABLE 50
RUSSIA: YEAR IN WHICH ECONOMIC RESERVES WILL BE DEPLETED

Commodity	Year of depletion
Barite	2021
Bauxite	Beyond 2025
Boron	Beyond 2025
Chromite	2010
Coal	Beyond 2025
Copper	2016
Diamond	2013
Fluorspar	2025
Gold:	
Alluvial	2011
Vein	2015
Graphite	2018
Iron ore	Beyond 2025
Kaolin	2020
Lead	2007
Magnesium carbonate	2016
Manganese ore	2008
Molybdenum	2016
Natural gas	Beyond 2025
Nickel	2016
Oil	2015
Phosphate	Beyond 2025
Platinum-group metals	2018
Potash	Beyond 2025
Salt	Beyond 2025
Tin	2015
Tungsten	2016
Vanadium	Beyond 2025

Source: Trutnev, Yury, 2005, Nadezhnaya osnava dlya razvitiya strang [A hopeful basis for the country's development]: Metally Evrazii, No. 2, p. 5.

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TABLE 51
RUSSIA: PRODUCTION AT LEADING RUSSIAN GOLD MINING COMPANIES

(Kilograms)

Company	Region	2004	2005
Amur a/s, ZAO	Khabarovsk Kray	6,614	4,780
Chukotka, a/s	Chukotsk Autonomous Oblast'	1,339	1,662
GRK Aldanzoloto OOO	Sakha (Yukutiya) Republic	4,978	3,025
LT-Resurs, ZAO	Irkutsk Oblast'	1,694	2,516
Neryungri-Metallik, OOO	Sakha (Yukutiya) Republic	1,468	1,230
Nirungan, OOO	do.	1,089	1,002
Omchak OAO	Magadan Oblast'	2,808	2,455
Omolonskaya ZRK, OAO	do.	3,940	4,696
Omsukchanskaya GGK, ZAO	do.	2,612	2,804
Oyna, a/s	Tyva Republic	1,199	1,305
Pokrovskiy Mine OAO	Amur Oblast'	4,701	5,740
Polimetal, MNPO, OAO	Magadan and Sverdlovsk Oblast's, Khabarovsk Kray	6,817	7,290
Polyarnaya, a/s	Chukotsk Autonomous Oblast'	1,020	994
Polyus ZAO	Krasnoyarsk Kray	34,040	33,500
Priisk Drazhnyy, OOO	do.	1,182	1,114
Priisk Solov'yevskiy, OAO	Amur Oblast'	1,371	1,463
Ros-DV, OOO	Khabarovsk Kray	1,004	1,049
Russdragmet OOO	Khabarovsk Kray, Chita Oblast'	6,143	5,041
Seligdar, a/s	Sakha (Yukutiya) Republic	1,973	1,698
Sovrudnik, OOO	Krasnoyarsk Kray	2,046	1,804
Susumanzoloto, OAO	Magadan Oblast'	2,409	2,801
Uralelktomed', OAO	Sverdlovsk Oblast'	962	1,273
Vitim, a/s	Irkutsk Oblast'	2,606	2,738
Votok, a/s	Khabarovsk Kray	925	1,016
Yuzhuralzoloto	Chelyabinsk Oblast'	4,129	3,649
Zapadnaya, a/s	Krasnoyarsk Kray	1,663	1,744
Zolotaya zvezda, ZDK, ZAO	Khakasiya Republic	885	1,048

Sources: Brayko, V.N., 2006, Rossiyskaya promyshlennost' po dobyche dragotsennykh metallov, itogi 2005 g. i perspektivy [The Russian industry for mining precious metals, 2005 results and perspectives]: Mineral'nye resursy Rossii, ekonomika I upravleniye [Mineral resources of Russia, economy and management]: no. 3, p. 61.

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TABLE 52
RUSSIA: PRODUCTION AT LEADING FOREIGN-OWNED GOLD MINING COMPANIES OPERATING IN RUSSIA AND THEIR RUSSIAN SUBSIDIARIES

(Kilograms)

Company and subsidiaries	2004	2005
Bema Gold Corp. (Canada):	2,612	2,804
Omsukchanskaya GGK, ZAO	2,612	2,804
High River Gold Mines (Canada):	4,898	4,874
Buryatzoloto OAO	4,898	4,874
Highland Gold Mining Ltd. (United Kingdom):	6,143	5,041
Russdragmet OOO	6,143	5,041
Kinross Gold Corp. (Canada):	3,949	4,696
Omolonskaya ZRK, OAO	3,949	4,696
Peter Hambro Mining Plc (United Kingdom):	7,509	8,195
Omchak OAO	4,701	5,740
Pokrovskiy Mine OAO	2,808	2,455

Sources: Brayko, V.N., 2006, Rossiyskaya promyshlennost' po dobyche dragotsennykh metallov, itogi 2005 g. i perspektivy [The Russian industry for mining precious metals, 2005 results and perspectives]: Mineral'nye resursy Rossii, ekonomika I upravleniye [Mineral resources of Russia, economy and management]: no. 3, p. 62.

TABLE 53
RUSSIA: PRODUCTION AT MAJOR IRON ORE MINING COMPLEXES

(Thousand metric tons)

Complex	2004	2005
Abakan	837.4	847.6
Kachkanar	8,963.7	8,648.9
Korshunovo	3,875.6	4,521.5
Kovdar	5,271.1	5,793.5
Lebedi	20,073.5	20,563.5
Mikhailovka	19,230.0	16,902.0
Olenogorsk	3,619.8	4,023.8
Sheregesh	1,663.9	1,563.9
Stoilo	12,565.0	11,891.0
Tashtagol	1,413.9	1,467.5
Teya	1,560.1	1,463.7

Source: Interfax Metals and Mining Weekly, 2006, CIS production of iron ore, concentrate, pellets, and agglomerate: Interfax Metals and Mining weekly, issue 15, no. 4, January 20-26, p. 42-43.

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TABLE 54
RUSSIA: PRODUCTION OF FERROUS METALS AT MAJOR METALLURGICAL PLANTS

(Thousand metric tons)

	Pig iron		Crude steel		Rolled steel	
Plant	2004	2005	2004	2005	2004	2005
Chusovoy	1,281.3	765.3	545.6	518.3	427.7	410.9
Magnitogorsk	9,645.4	9,656.5	9,122.8	8,468.9	10,273.7	9,885.8
Mechel	3,784.8	3,348.5	3,616.8	3,618	3,314.1	3,256.3
Nizhniy Tagil	4,782	4,941.4	4,960.6	4,597.8	4,445	5,024.6
Kuznetsk	2,218.4	1,937.8	2,463.9	2,549.4	2,166	1,930
Novolipetsk	8,994.1	7,885.6	5,603.5	5,683	8,576.3	7,978.7
Oskol	--	--	2,463.9	2,549.4	2,134.1	2,344.2
Serov	367.7	369.8	631.5	659.5	510.6	522
Severstal	7,921.9	7,921.9	11,281.6	11,393.8	9,139.4	9,613.8
West Siberian	4,558	4,572.9	5,491.3	5,574.5	4,545.6	4,686.1

-- Zero.

TABLE 55
TAJIKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum, primary		289,000	307,589	319,360	358,082	379,630
Antimony, Sb content of concentrate[e]		2,500	3,000	1,800	2,000	2,000
Bismuth, mine[e]		5	--	--	--	--
Gold[e]	kilograms	2,700	2,700	2,700	3,000	3,000
Lead, Pb content of concentrate[e]		800	800	800	800	800
Mercury, Hg content of concentrate[e]		40	20	30	30	30
Silver, Ag content of concentrate	kilograms	5,000	5,000	5,000	5,000 [e]	5,000 [e]
INDUSTRIAL MINERALS						
Cement		70,000 [r]	100,000 [r]	166,300 [r]	193,600	253,100
Fluorspar[e]		9,000	9,000	9,000	9,000	9,000
Gypsum		NA [r]	NA [r]	50,100 [r]	57,200 [r]	8,300 [r]
Nitrogen, N content of ammonia		NA [r]	15,300 [r]	21,500 [r]	44,900 [r]	45,000 [e]
MINERAL FUELS AND RELATED MATERIALS						
Coal		24,200 [r]	35,500 [r]	46,500	88,300 [r]	94,900
Natural gas	thousand cubic meters	52,000 [r]	33,000 [r]	32,800	35,600	29,300
Petroleum, crude		16,100 [r]	16,100 [r]	17,700	18,900 [r]	21,600

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]In addition to the commodities listed, Tajikistan produces a number of other mineral commodities for which information is inadequate to derive estimates.

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TABLE 56

TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Aluminum		Tajik aluminum plant (TadAZ)	Tursunzade	517,000
Antimony, ore		Anzob mining-beneficiation complex	Dzhizhikrutskoye Sb-Hg deposit	700,000
Antimony, metal		Isfara hydrometallurgical plant	Isfara	500
Arsenic		Mosrif deposit	NA	NA
Bismuth		Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	25
Do.		Isfara hydrometallurgical plant	Isfara	500
Bismuth, copper, fluorspar, gold, silver, zinc (ore processing)		Adrasman mining-beneficiation complex	Kanimansurskoye deposit	650,000 [3]
Boron		Ak-Arkhar deposit	Badakhshan Region	NA
Coal		Isfara hydrometallurgical plant	Isfara	300,000
Do.		Shurab brown coal deposit	Shurab Region	NA
Do.		Fan-Yagnob hard coal deposits	Pyandzh Region	50,000
Copper-lead-zinc		Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	2,500
Dolomite		Yavan electrochemical complex	Pashkharvoskoye deposit	NA
Fluorspar, concentrate		Takob mining-beneficiation complex	Takob and Krasnye Kholmy deposits	60,000 [3]
Gold, in ore	kilograms	Tajikzoloto mining-beneficiation complex, Pamir Artel	Darvazy and Rankul placer deposits, placers in central and southern parts of country	5,000 [3]
Do.	do.	Zerafshan Gold Company	Dzhilau and Taror deposits, Sughd Oblast'	2,500 [3]
Do.	do.	Darvaz joint venture	Yak-Suyskoye deposit, Khatlonskaya Oblast'	2,000
Do.	do.	Aprelevka joint venture	Aprelevka deposit	200
Gold, ore processing	do.	Vostokredmet refinery	Chkalovsk	NA
Do.	do.	Kansayskaya factory	Aprelevka, Burgunda, Kyzyl-Chek, and Shkol'noye deposits	165,000 [3]
Lead-zinc		Kansayskoye mining complex	Kara-Mazar Region	NA
Do.		Altyn-Topkan mining directorate	Altyn-Topkan deposit (mining ceased in 1997)	NA
Do.		do.	Pay Bulak deposit (mining ceased in 1997)	NA
Do.		Adrasman mining-beneficiation complex	NA	NA
Do.		Takaeliyskiy metallurgical complex	NA	NA
Limestone		Dushanbe cement complex	Kharangonskoye deposit	NA
Loam		do.	Varzobskoye Ushchel'ye deposit	NA
Marble		Dashtak deposit	Darvaz region	NA
Do.		Jilikul deposit	Pendzhikent region	NA
Do.		Dal'yan Bolo deposit	Shakhristanskiy region	NA
Mercury		Anzob mining-beneficiation complex	Dzhizhikrutskoye deposit	150
Natural gas and petroleum:				
Natural gas	thousand cubic meters	Sixteen oil-gas deposits under exploration, which includes Ayritanskoye, Madaniyatskoye, and Ravatskoye	Fergana depression	200,000 [3]
Petroleum		Beshtentyakskoye, Kichik-Belskoye, Shaambary, and Uzunkhorskoye deposits	Southern Tajik depression	200,000 [3]
Salt		Yavan electrochemical complex	Tut-Bulakskoye deposit	NA
Do.		Voseyskiy plant	Khodzha-Muminskoye deposit	NA
Do.		Ashtskiy plant	Kamyshkurganskoye deposit	NA
Do.		Khoja-Sartez, Samanchi, and Tanabchi deposits	NA	NA
Silver		Adrasman mining-beneficiation complex	Bolshoy Kanimansur deposit	15,000
Strontium		Chaltash, Chikultan, and Daudyr deposits	Khatlon Region	180,000
Tin-tungsten		Tafkon deposit	NA	NA
Tungsten ore		Maykhura deposit	95 kilometers of Dushanbe, central Tajikistan	150,000

See footnotes at end of table.

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TABLE 56—Continued
TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.
[1]Table includes data and information available through December 2006.
[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.
[3]Capacity estimates are totals for all enterprises that produce that commodity.

TABLE 57
TURKMENISTAN: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS						
Bentonite[e]		50,000	50,000	50,000	50,000	50,000
Bentonite powder[e]		250	250	250	250	250
Bischofite[e]		100	100	100	100	100
Bromine[e]	kilograms	150,000	150,000	150,000	150,000	150,000
Cement[e]		450,000	450,000	450,000	450,000	450,000
Epsomite		NA	NA	NA	NA	NA
Ferrous bromide, 51% Br[e]		85	85	85	85	85
Gypsum[e]		100,000	100,000	100,000	100,000	100,000
Iodine[e]		200,000	200,000	200,000	250,000	270,000
Lime[e]		16,000	16,000	16,000	16,000	16,000
Nitrogen, N content of ammonia[e]		75,000	85,000	85,000	85,000	85,000
Salt[e]		215,000	215,000	215,000	215,000	215,000
Sodium sulfate[e]		60,000	60,000	60,000	60,000	60,000
Sulfur[e]		9,000	9,000	9,000	9,000	9,000
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	46,300	45,000	59,100	58,570	55,800
Petroleum, crude		7,697,000 [r]	8,919,000 [r]	9,306,000 [r]	10,051,000	9,700,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised.
[1]Table includes data available through November 2006.
[2]Tajikistan produces a number of other mineral commodities not listed in the table for which information is inadequate to derive estimates.

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TABLE 58

TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity
Ammonia	thousand metric tons	Maryzoat Association	Mary Region	400,000
Argillite	cubic meters	Keramzit plant	Yagmanskoye deposit	200,000
Barite-witherite		Arpaklenskiy mining enterprise	Arpaklen deposit	10,000
Do.		Kumytash deposit and other deposits	NA	NA
Bischofite, epsomite, Galauber's salt, sea salt		Karabogazsulfate Association	Kara-Bogaz-Gol Lagoon, off the Caspian Sea	NA
Bromine		Cheleken plant	Cheleken Region	4,740
Do.		Nebitdag plant	Vyshka, Stantsiya	2,370
Cement, from:				
Bench gravel and loam		Bezmeinskiy cement plant	Bezmeinskoye deposit	1,400,000 e
Limestone and clay		Kugitangskoye deposit	NA	NA
Limestone and marl		Gingol'skoye deposit	NA	NA
Clays:				
Bentonite		Oglanly Mine	Oglanly Region	100,000
Kaolin		Ashkhabad glass plant	Kyzylkainskoye deposit	80,000 e
Do.		Tuarkyrskoye deposit	250 kilometers southeast of Turkmenbashi	NA
Coal, oxidized		do.	do.	NA
Dolomite		Ashkhabad glass plant	Kelyatinskoye deposit	6,000 e
Gypsum		IA Turkmenmineral	Mukry, Tagorin deposits	300,000
Do.		Wastes from Gaurdak sulfur deposit	Gaurdak, Gora	400,000
Do.		Krasnovodsk Aylagy (anhydride) deposit	9 kilometers east of Turkmenbashi	160,000
Iodine		Cheleken plant	Cheleken Region	355
Do.		Nebitdag plant	Vyshka, Stantsiya	255 e
Limestone		Deposits:		
Do.		Gaurdak	4 kilometers northeast of Gaurdak	NA
Do.		Kara-Dzhumalakskoye	60 kilometers from Gaurdak	NA
Limestone, for facing materials		Charshanginskoye, Gaurdakskoye, Geok-Tepinskoye, Kaylyu, Krasnovodsk Aylagy (tuff and granite), and Tyuzmergenskoye deposits	NA	NA
Do.	cubic meters	Tagarinskoye deposit	8 kilometers from Gaurdak	1,000 e
Limestone, for filing stone	do.	Aeroport deposit	21 kilometers northeast of Turkmenbashi	2,000
Do.	do.	Bekdashskoye deposit	200 kilometers north of Turkmenbashi	5,000
Do.	do.	Dostluksoye deposit	230 kilometers southeast of Turkmenbashi	2,000
Do.	do.	Mukrinskoye deposit	60 kilometers southwest of Gaurdak	25,000
Natural gas	million cubic meters	Achakskoye, Dauletabad, Donmez, Gygyrlinskoye, North and South Naipskiye, West Shatlykskiye, and Yashlar deposits	Onshore in eastern and southwestern parts of country and offshore in Caspian Sea; Amu-Dar'ya and Murgab Basins; Dashoguzskiy, Lebapskiy, Maryyskiy deposits	90,000 e, 3
Petroleum:				
Crude		Barsa-Gelmesskoye, Burunskoye, Cheleken, Gograndagskoye, Kamyshldzhinskoye, Korturtepinskoye, Kum Dag, Kuydzhikskoye, and Okaremskoye deposits	Onshore in southwestern part of country and offshore in the Caspian Sea	5,500,000 e, 3
Refined	42-gallon barrels/day	Chardzhouskiy Rayon refinery	Seydi, Chardzhouskiy Rayon	120,500
Do.	do.	Turkmenbashi refinery	Turkmenbashi	116,500
Natural pigment		Bakhchesu/Cheshme/Gadyn deposit	28 kilometers southwest of Serdar	NA
Ozokerite		Cheleken mining enterprise	NA	NA

See footnotes at end of table.

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TABLE 58—Continued

TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity
Potash (sylvinite, carnallite)		Karlyuk deposit (experimental mine closed 1998)	25 kilometers from Gaurdak	NA
Do.		Karabil'skoye deposit	17 kilometers south of Gaurdak	NA
Quartz sand		Annauskoye, Babadurmazskoye, and Bakhardenskoye deposits	NA	NA
Rock salt		Gaurdak deposit	8 kilometers from Gaurdak	15,000 [e]
Do.		Khodzhaguymaskoye deposit	4 kilometers west of Gaurdak	NA
		Kugitangskoye deposit	75 kilometers from Gaurdak	2,000 [e]
		Uzun-Kudukskoye deposit	20 kilometers from Gaurdak	2,000 [e]
Salt		Kuulinskoye deposit	40 kilometers north of Turkmenbsahi	650,000 [e]
Sand and gravel	cubic meters	Dushaksoye deposit	NA	1,150,000
Do.	do.	Kala-I-Morskoye deposit	NA	925,000
Do.	do.	Kernayskoye deposit	NA	36,000
Do.	do.	Kubatayskoye deposit	NA	740,000
Do.	do.	Ufrinskoye deposit	NA	900,000
Sodium sulfate		Karabogazsulfate Association	Bekdash, Kara-Bogaz Lagoon (off Caspian Sea)	400,000
Strontium (celesite)		Arikskoye deposit (mining ceased 1992)	Near Gaurdak	NA
Do.		Shakhtaminskoye deposit	do.	NA
Sulfur		IA Turkmenmineral	Gora deposit	340,000
Do.		Gaurdak plant	Gaurdak deposit (mining ceased 1997)	500,000 [e]
Do.		Darvaza, Segli-Kar, and Kara-Kum sulfur plants	Kara-kum deposit (mining ceased 1962)	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data and information available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

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TABLE 59
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity	2001	2002	2003	2004	2005
METALS					
Alumina	1,343,000	1,351,000	1,434,050	1,562,170	1,632,000
Aluminum:					
Primary	106,000	112,459	113,640	113,151	114,224
Secondary	130,000	130,000	130,000	130,000	130,000
Total	236,000	242,459	243,640	243,151	244,224
Cadmium, metal[e]	25	25	25	25	25
Germanium[e]	--	10	20	20	20
Iron and steel:	NA	NA	NA	NA	NA
Iron ore, marketable:					
Gross weight	54,650,000	58,900,000	62,497,600	65,540,000	68,569,600
Fe content	30,000,000	32,300,000 [2]	34,300,000	36,000,000	37,700,000
Metal:					
Pig iron	26,400,000	27,560,000	29,570,000	31,060,000	30,747,000
Ferroalloys:					
Blast furnace:[e]					
Ferromanganese	85,000	85,000	85,000	79,000 [r]	30,000
Spiegeleisen	5,000	5,000	5,000	5,000	5,000
Electric furnace:					
Ferromanganese	231,000	250,617	250,000 [e]	375,990	330,000
Ferronickel[e]	41,000	41,000	-- [r]	78,000	78,000
Ferrosilicon	231,000	250,617	250,000 [e]	248,060	248,000
Silicomanganese	702,389	732,592	740,000 [e]	1,060,000	1,000,000
Other[e]	25,000	25,000	25,000	25,000	25,000
Total	1,320,389	1,389,826	1,355,000 [r]	1,871,050 [r]	1,720,000
Steel:					
Crude	33,110,000	34,538,000	36,900,000	38,738,000	38,636,000
Finished, rolled	25,300,000	26,400,000	29,160,000	30,160,000	22,180,000
Pipe	1,600,000	1,522,700	2,054,000	2,034,000	2,293,000
Lead, refined, secondary[e]	12,000	12,000	7,000	7,000	6,000
Magnesium, primary[e]	3	3	3	3	2,000
Manganese ore, marketable:					
Gross weight	2,700,100	2,469,600	2,590,900	2,362,000	2,260,000 [e]
Mn content[e]	930,000	840,000	880,000	810,000 [r]	770,000
Mercury	--	NA	--	--	--
Nickel:					
Mine output, Ni content of laterite ore[e]	1,500	2,000	2,000	2,000	2,000
Ni content of ferronickel[e]	2,500	6,000	--	12,000	14,000
Silicon[e]	NA	NA	163,000	180,000	180,000
Titanium:					
Ilmenite concentrate:					
Gross weight	484,500	512,400	420,500	370,000	370,000
TiO_2 content, 61%[e]	296,000	313,000	257,000	226,000	226,000
Rutile concentrate, 95% TiO[e]	60,000	70,000	60,000	60,000	60,000
Metal, sponge[e]	6,100 [e]	6,200 [e]	6,934	7,497	8,397
Zirconium concentrates[e]	33,600	34,300	35,000	35,000 [r]	35,000
INDUSTRIAL MINERALS					
Bromine[e] thousand kilograms	3,000	3,000	3,000	3,000	3,000
Cement	5,786,000 [r]	7,157,000 [r]	8,923,000 [r]	10,635,000	12,183,000
Clays:[e]					
Bentonite	300,000	300,000	300,000	300,000	300,000
Kaolin	225,000	225,000 [2]	225,000	225,000	225,000
Diamond, synthetic[e] carats	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000
Graphite[e]	7,500	7,500	7,500	7,500	7,500
Gypsum thousand metric tons	151	207	264	300 [e]	350 [e]
Nitrogen, N content of ammonia	3,700,000 [2]	3,700,000 [2]	3,900,000	3,900,000	4,300,000

See footnotes at end of table.

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TABLE 59—Continued
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS—Continued						
Potash, K_2O equivalent[e]		75,000	60,000	60,000	50,000	65,000
Salt, rock[e]		2,244,000 r	2,358,000 r	2,757,000 r	3,339,000 r	3,400,000
Soda ash[e]		650,000	678,000	650,000	650,000	700,000
Sulfur, native[e]		126,000	124,000	142,000	136,000 r	135,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	17,700	15,000	14,427	18,295	17,000
Bituminous	do.	63,000	66,400	63,866	62,100	58,000
Lignite	do.	1,000	1,000	950	3,000	3,000
Total[7]	do.	81,700	82,400	79,243	83,395	78,000
Coke		19,500,000	18,596,000	20,600,000	18,858,000	21,999,000
Natural gas	cubic meters	18,200,000	18,400,000	19,460,000	19,000,000	19,300,000
Peat, horticultural use and fuel use[e]		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Petroleum:						
Crude and gas condensate:						
As reported	gravimetric tons	3,700,000	3,720,000	3,975,000	4,179,000	4,269,000
Converted[e]	42-gallon barrels	27,200,000	27,304,800	29,200,000	30,700,000	31,400,000
Refinery products		16,100,000	20,200,000	21,900,000	NA	NA
Uranium:						
U content[e]		750	800	800 r	800 r	800
U_3O_8 content		884	943	943 r	943 r	943

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available. -- Zero.
[1]Table includes data available through November 2006.
[2]Reported figure.

TABLE 60
UKRAINE: FERROUS METALS PRODUCTION AT STEEL MILLS IN 2004 AND 2005

(Thousand metric tons)

	Pig iron		Steel		Rolled steel	
Plant	2004	2005	2004	2005	2004	2005
Alchevs'k	2,894	2,923	4,453	4,379	3,562	3,603
Azovstal	5,180	5,239	6,897	6,950	5,699	5,537
Donets'k	--	--	--	--	153	146
Dnepropetrovsk	1,150	1,496	1,021	1,247	949	1,090
Dneprospetstal	--	--	502	506	301	308
Dneprovskiy	3,041	2,878	3,250	3,229	2,859	2,910
ISTIL	--	--	759	812	1,058	756
Kirov	815	825	1,938	1,029	844	916
Kyrvy Rih	6,341	6,159	7,130	6,955	6,131	6,044
Yenakievskiy	2,184	1,948	2,463	2,254	2,203	2,180
Zaporozh'ye	3,355	3,541	4,453	4,379	3,562	3,603

-- Zero.

Source: Kisil', V.V., Konovalov, Yu.V., and Khukov, V.R., 2006, Metallurgicheskiy kompleks Donetskoy oblasti (itogi raboty v 2005 g., perspekitivy raxvitiya) [The metallurgical complex of Donetsk oblast (results of work in 2005, perspectives of development)]: Chernaya Metallurgiya [Ferrous Metallurgy], no. 5, p. 5-9].

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TABLE 61
UKRAINE: MANGANESE ORE OUTPUT AT MINING AND BENEFICIATION COMPLEXES IN 2005

(Thousand metric tons)

Enterprise	Production	2005 as percentage of 2004
Marganets	907	91.0
Ordzhonikidze	1,310	97.7

Source: Interfax Mining and Metals Report, 2006, Ukraine reduces manganese output: Interfax Mining and Metals Report, no. 1-2, January 1-12, p. 42.

TABLE 62
UKRAINE: COMMERCIAL IRON ORE PRODUCTION BY MINING AND BENEFICIATION COMPLEXES IN 2005

(Thousand metric tons)

Enterprise	Production	2005 as percentage of 2004
Inguletskiy	13,533	98.3
Kamysh-Brunskiy	--	--
Krivbassruda	6,458	100.0
Novokrivorozhskiy	7,030	101.5
Poltavskiy	8,314	105.1
Severnyy	10,679	121.2
Sukhaya Balka	3,240	105.5
Tsentralnyy	5,325	110.6
Yuzhnyy	8,135	98.7
Zaporozh'ye	4,210	107.7

-- Zero.

Source: Interfax Mining and Metals report, 2006, CIS production of iron ore, concentrate, pellets, and agglomerate: Interfax Mining and Metals Report, no. 4, January 20-26, p. 42-43.

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TABLE 63
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina		Mykolayiv refinery	Mykolayivs'ka Oblast'	1,200,000
Do.		Zaporozh'ye (Dneprovsk) refinery	Zaporiz'ka Oblast'	245,000
Aluminum, primary		Zaporozh'ye (Dneprovsk) smelter	do.	120,000
Coal:				
Hard	thousand metric tons	Donets coal basin with about 225 mines produces more than 90% of Ukraine's coal	Dnipropetrovs'ka, Donets'ka, and Luhans'ka Oblasts'	130,000 [3]
Do.		Lviv-Volynskiy Basin produces remainder from 18 mines	Western Ukraine	6,000,000 [3]
Brown		Dneprovskoye Basin	Central Ukraine	7,000,000
Ferroalloys:				
Ferrochrome		Zaporozh'ye plant	Zaporiz'ka Oblast'	NA
Ferromanganese		do.	do.	NA
Do.		Nikopol' ferroalloys plant	Nikopol'	250,000
Ferromanganese, blast furnace		Kostyantynivka metallurgical plant	Donets Basin	NA
Do.		Kramatorsk metallurgical plant (production ended in 1999)	NA	NA
Manganese metal		Zaporozh'ye plant	Zaporiz'ka Oblast'	NA
Ferrosilicon		Nikopol' ferroalloys plant	Nikopol'	200,000
Do.		Stakhanov plant	Luhans'ka Oblast'	NA
Silicomanganese		do.	do.	1,200,000
Do.		Zaporozh'ye plant	Zaporiz'ka Oblast'	160,000
Do.		Nikopol' ferroalloys plant	Nikopol'	NA
Graphite		Zavalyevskiy graphite complex	Zavalyevskiy deposit	40,000
Iron ore:				
Underground mining		Krivbassruda production association with 16 mines	Kryvyy Rih Basin	15,000,000 [3]
Do.		Eksplutatsionnaya Mine of the Zaporozh'ye Iron Ore Integrated Works cjsc	do.	3,500,000
Open pit mining		Inguletskiy, Kamysh-Burunskiy, Novokrivorozhskiy, Poltaviskiy, Severnyy, Sukhaya Balka, Tsentralnyy, and Yuzhniy mining-beneficiation complexes	do.	90,000,000 [3]
Kaolin		Prosyanovskoye mining-beneficiation complex	Dnipropetrovs'ka Oblast'	NA
Lead, secondary		Ukrtsink plant	Kostyantynivka	70,000
Magnesium		Zaporozh'ye plant	Zaporiz'ka Oblast'	10,000
Do.		Magnii concern	Kalush	18,000
Manganese:				
Ore, marketable		Marganets and Ordzhonikdze mining-beneficiation complexes	Nikopol' basin	6,000,000 [3]
		Tavricheskiy complex (under development)	Bol'shoy Tokmak basin	
Metal		Zaporozh'ye plant	Zaporiz'ka Oblast'	40,000
Sinter		Nikopol' ferroalloys plant	Nikopol	3,000,000
Mercury		Nikitovskiy mining-metallurgical complex	Donets'ka Oblast'	120
Nickel, Ni content in FeNi		Pobuzhskiy mining-beneficiation complex, comprising three open pit mines and smelter	Pobugskoye Basin	7,000 [3]
Potash, K_2O equivalent		Khlorvinil production association, Stebnik potash plant	Pricarpathian Region	300,000
Steel, crude		Donets'k acquisitions and (co-)owners:		
		Industrial Union of Donbas (IUD):		
Do.		Alchevs'k steel mill	Alchevs'k	4,500,000
Do.		Azovstal' steel mill	Mariupol'	4,000,000
Do.		Donets'k steel mill	Donets'ka Oblast'	1,300,000
Do.		Dnepropetrovsk pipe plant	Dnepropetrovsk Oblast'	NA
Do.		Khartsyzsk pipe plant	Donets'ka Oblast'	NA
Do.		Danko: Yenakiyeveskiy steel mill	NA	1,200,000

See footnotes at end of table.

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TABLE 63—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Steel, crude	Donets'k acquisitions and (co-)owners:		
	Privat Bank:		
Do.	Dnepropetrovsk pipe plant	Dnepropetrovsk Oblast'	1,230,000
Do.	Zaporozh'ye rolling mill	Zaporiz'ka Oblast'	2,300,000
Do.	Dneprovskiy steel mill	Dniprodzerzhyns'k	3,850,000
Do.	do.	Dnipropetrovs'ka Oblast'	1,900,000
Do.	Kostyantynivka steel mill	Donets Basin	NA
Do.	Dneprospetstal	Zaporiz'ka Oblast'	1,400,000
Do.	Il'yich plant	Mariupol'	7,300,000
Do.	ISTIL mini-mill	Donetsk	1,000
Do.	Kirov plant	Makeyevka	4,000,000
Do.	Kryvy Rih plant	Kryvyy Rih	10,650,000
	Interpipe group:		
Do.	Nizhnedneprovsk pipe plant	NA	NA
Do.	Nikopol' pipe plant	NA	NA
Sulfur	Sera production association	Rozdol mining complex mines: Rozdol, Soroks, and Zdhidalchev deposits Yarvorov complex mines: Nemirov-Yazov deposits in Livivs'ka and Kyyivs'ka Oblasts'	1,500,000 [3]
Titanium:	Facilities:		600,000 [3]
Ilemenite concentrate	Irshansk mining-beneficiation complex	Irsha Valley	
	Vol'nogorsk state mining-metallurgical complex	Dnipropetrovs'k Region	
	Verkhnedneprovsk mining-metallurgical complex	Verkhnedneprovsk Region	
Rutile	do.	do.	60,000
Do.	Vol'nogorsk state mining-metallurgical complex	Dnipropetrovs'k Region	NA
Sponge	Zaporozh'ye titanium-magnesium plant	Zaporiz'ka Oblast'	20,000
Uranium	Zheltye Vody complex	Northern part of Kryvyy Rih Basin	NA
Zinc, secondary	Ukrtsink plant	Kostyantynivka	25,000
Zirconium:			
Ore, zircon	Verkhnedneprovsk mining-metallurgical complex	Verkhnedneprovsk Region	100,000
Do.	Vol'nogorsk state mining-metallurgical complex	Dnipropetrovs'k Region	NA
Metal and compounds	Pridneprovsk chemical plant	Dnipropetrovs'ka Oblast'	NA
Do.	Kharkiv physical-technical institute	Kharkivs'ka Oblast'	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data and information available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

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TABLE 64
UKRAINE: FOREIGN TRADE IN MINERAL COMMODITIES IN 2005

Commodity	Exports			Imports		
	Value, (thousand dollars)	Percentage of 2004	As percentage of the total volume	Value, (thousand dollars)	Percentage of 2004	As percentage of the total volume
Base metals and preparations thereof:	14,047,248.78	107.66	40.97	2,468,818.31	140.84	6.83
Aluminum and preparations thereof	317,516.10	63.30	0.93	223,062.66	126.07	0.62
Copper and preparations thereof	168,684.44	84.98	0.49	145,353.17	1.5 times more	0.40
Ferrous metals	11,485,924.77	106.69	33.50	1,151,201.02	141.30	3.19
Preparations from ferrous metals	1,851,996.85	127.92	5.40	529,334.46	1.5 times more	1.46
Lead and preparations thereof	11,624.56	104.74	0.03	11,026.50	5.2 times more	0.03
Nickel and preparations thereof	3,882.08	146.21	0.01	73,505.74	103.44	0.20
Tin and preparations thereof	2,232.01	92.3 times more	0.01	6,939.66	80.95	0.02
Zinc and preparations thereof	124.61	92.34	(1)	44,634.55	115.26	0.12
Other base metals	112,976.18	2.2 times more	0.33	58,933.59	1.7 times more	0.16
Mineral products:	4,707,983.04	108.87	13.73	11,567,831.37	106.66	32.01
Fertilizers	971,430.16	129.35	2.83	117,556.42	1.6 times more	0.33
Mineral fuel, petroleum and petroleum distillation products	3,344,918.97	98.75	9.76	10,661,921.21	104.93	29.50
Of which:						
Coal	259,992.53	104.01	0.76	714,323.92	79.35	1.98
Crude oil	25,297.46	26.08	0.07	4,600,512.73	95.11	12.73
Natural gas	385,240.21	98.43	1.12	3,946,004.31	109.87	10.92
Ores, slags, ashes	1,045,425.53	1.5 times more	3.05	680,049.16	134.85	1.88
Salt, sulfur, plastering materials, cement	317,638.54	123.18	0.93	225,861.00	125.32	0.62
Precious stones, metals, and preparations thereof	99,440.50	(1)	0.29	224,340.88	(1)	0.62
Products from stone, gypsum, cement, asbestos, glass:	218,679.66	77.85	0.64	516,192.60	131.96	1.43
Products from stone, gypsum	73,421.46	129.48	0.21	135,914.75	124.73	0.38
Ceramic products	80,054.72	106.55	0.23	220,627.81	135.22	0.61
Grand total	34,286,748.26	104.96	100.00	36,141,094.96	124.64	100.00

[1]Less than 0.01 percent.

Source: State Committee of Ukraine, accessed February 26, 2007, accessed at URL http://www.ukrstat.gov.ua.

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TABLE 65
UKRAINE: MAJOR EXPORTS AND IMPORTS OF MINERAL COMMODITIES IN 2005

Commodity and country[1]	Value (dollars)	Percentage of total value[2]
EXPORTS		
Iron and steel:	11,451,281,052	100.00
Of which:		
Russia	1,307,266,995	11.42
Turkey	1,149,803,688	10.04
Italy	824,150,089	7.20
Egypt	593,634,235	5.18
Mineral fuels, mineral oils and products of their distillation:	3,342,973,012	100.00
Of which:		
Italy	517,857,240	15.49
Switzerland	300,237,406	8.98
Germany	247,598,208	7.41
Articles of iron or steel:	1,848,336,249	100.00
Of which:		
Russia	687,821,930	37.21
Kazakhstan	133,689,655	7.23
IMPORTS		
Mineral fuels, mineral oils and products of their distillation:	10,661,441,123	100.00
Of which:		
Russia	7,298,077,737	68.45
Turkmenistan	2,672,313,242	25.07

[1]Commodity groups are in order by value.
[2]Export and import country percentages may not add to 100 percent.

Source: United Nations Statistics division, Commodity trade Statistical Database (COMTRADE) accessed via URL http://www.unstats.un.org/unsd/comtrade.

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TABLE 66
UZBEKISTAN: DISTRIBUTION OF MINING ENTERPRISES BASED ON TYPE

(Number of enterprises)

Sector	2002	2003	2004
Coal mining	11	8	5
Metallurgy:			
Ferrous	33	31	35
Nonferrous	58	57	52
Oil:			
Extraction	6	6	4
Processing	6	6	9

Source: Promyshlennost' Respubliki Uzbekistana 2004 [Industry of the Republic of Uzbekistan 2004], Tashkent, 2005, p. 13.

TABLE 67
UZBEKISTAN: DISTRIBUTION OF LABOR FORCE AMONG MINING ENTERPRISES

(Thousand persons)

Sector	2002	2003	2004
Total industrial labor force	679.8	646.8	624.8
Of which:			
Coal mining	4.6	4.7	7.6
Metallurgy:			
Ferrous	8.0	8.0	8.2
Nonferrous	57.8	59.9	61.0
Oil:			
Extraction	2.0	1.9	1.6
Processing	7.3	8.4	8.8

TABLE 68
UZBEKISTAN: STATE VERSUS PRIVATE OWNERSHIP IN THE MINERAL PRODUCING SECTORS

(Percentage)

	Total number of enterprises		Total value of production		Total number of workers	
Sector	2003	2004	2003	2004	2003	2004
Construction materials:						
State	8.2	7.1	8.0	7.9	8.5	8.1
Private	91.8	92.9	92.0	92.1	91.5	91.9
Ferrous metallurgy:						
State	3.2	2.9	2.0	1.9	2.8	3.3
Private	96.8	97.1	98.0	98.1	97.2	96.7
Fuel:						
State	9.1	2.3	50.0	3.3	47.1	24.2
Private	90.9	97.7	50.0	96.7	52.9	75.8
Nonferrous metallurgy:						
State	8.8	5.8	56.3	50.2	58.3	58.6
Private	91.2	94.2	43.7	49.8	41.7	41.4

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TABLE 69
UZBEKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum, secondary		3,000	3,000	3,000	3,000	3,000
Copper:[e]						
Mine output, Cu content		78,000	80,000	80,000	95,000	100,000
Metal:						
Blister, refinery:						
Primary		80,000	75,000	75,000	105,000 r	115,000
Secondary		10,000	--	--	--	--
Total		90,000	75,000	75,000	105,000 r	115,000
Smelter:						
Primary		80,000	75,000	75,000	105,000 r	115,000
Secondary		10,000	--	--	--	--
Total		90,000	75,000	75,000	105,000 r	115,000
Gold[e]	kilograms	87,000	90,000 [2]	90,000 r	93,000	90,000
Molybdenum, mine output, Mo content[e]		500	500	500	500	500
Rhenium[e]	kilograms	NA	NA	NA	NA	NA
Silver, mine output[e]	do.	80,000	80,000	80,000	80,000	83,000
Steel:						
Crude		460,000	450,000 e	472,000 e	607,300 r	607,253
Rolled		430,000	420,000 e	446,521	562,200 r	562,000
Zinc, metal, smelter, primary[e]		35,000	30,000	30,000	30,000	30,000
INDUSTRIAL MINERALS						
Cement		3,926,700 r	4,062,200 r	4,804,800 r	5,067,800 r	5,068,000
Clays, kaolin[e]		5,500,000	5,500,000	5,500,000	5,500,000	5,500,000
Feldspar[e]		4,300	4,300	4,300	4,300	4,300
Graphite[e]		60	60	60	60	60
Iodine[e]	kilograms	2,000	2,000	2,000	2,000	2,000
Nitrogen, N content of ammonia[e]		670,000	740,000	815,000 e	875,300 r	850,000 e
Phosphate rock:[e]						
Gross weight		200,000	425,000	430,000	430,000	430,000
P_2O_5 content		47,400	101,000	102,000	102,000	102,000
Sulfur:						
Byproduct:[e]						
Metallurgy		160,000	170,000	170,000	170,000	170,000
Natural gas and petroleum		300,000	350,000	350,000	350,000	350,000
Total		460,000	520,000	520,000	520,000	520,000
Sulfuric acid		NA	841,800	802,400	834,300	740,500
MINERAL FUELS AND RELATED MATERIALS						
Coal		2,800,000	2,735,000	1,909,000	2,700,000	2,700,000
Natural gas	million cubic meters	56,350	57,670	57,481	59,864 r	59,686
Petroleum and gas condensate		7,176,000	7,198,000	7,134,000	6,580,000 r	54,490,000
Petroleum refinery products		NA	5,500,000	5,807,000	NA	NA
Uranium:						
U content		1,962	1,860	1,589 r	2,016	2,300
U_3O_8 content		2,314	2,193	1,874	2,377	2,712

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available. -- Zero.
[1]Table includes data available through November 2006.
[2]Reported figure.

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TABLE 70
UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Bismuth		Ustarassay deposit (depleted)	Chotqol and Kuraminskiy Khrebet Regions	NA
Cesium, lithium, rubidium		Shava-Say deposit	NA	NA
Clays:				
Bentonite		Arab-Dasht and Khaudag deposits	NA	NA
Kaolin		Angren deposit	Angren Region	8,000,000
Coal		Central Asian Coal Association (mining):		
		Angren brown coal deposit	do.	6,000,000
Do.		Baysunskoye and Shargunskoye deposits	Surkhandarya Region	1,000,000 [3]
Copper:				
Mine output, Cu content		Almalyk mining-metallurgical complex	Dalneye, Kalmakkyrgan, and Sary-Cheku deposits	100,000 [3]
Metal		Almalyk refinery	Olmaliq	130,000
Diamond		Karashok and Kok-Say deposits	Nawoiy District	NA
Feldspar		Karichasayskoye and other deposits	Deposits in Samarqand and Toshkent Wiloyati Regions; Karakalpakstan (Kara-Kalpakskaya ASSR)	120,000 [3]
Fertilizers		Ammophos production association	Olmaliq	NA
Do.		Azot production association	Farghona	NA
Do.		Elektrokhimprom production association	Chirchiq	NA
Do.		Kokand superphosphate plant	Qo'qon	NA
Do.		Naviazot production association	Nawoiy Wiloyati	NA
Do.		Samarkand chemicals plant	Samarqand	NA
Fluorspar		Agata-Chibargata, Aurakhmat, Kengutan, Kyzylbaur, Naugarzan, Nugisken deposits	East of Toshkent Wiloyati	150,000
Do.		Syrpatash deposit	Namanganskaya Oblast'	NA
Gold	kilograms	Adzhi-Bugutty, Amantaytau, Balpantau, Bulutkan, Donguz-Tau, Muruntau, and Taurbay deposits	Kyzylkum Region	85,000 [3]
Do.		Navoi Integrated Mining and Metals complex	Muruntau deposit	50
Do.		Kochbulak and Kyzyl-Al'ma-Say deposits	Tashkentskaya Oblast'	NA
Do.		Almalyk mining and metallurgical complex	Dalneye, Kalmakkyrgan, and Sary-Cheku deposits	NA
Graphite		Tadzhi-Kazgan deposit	Navoiyskaya Oblast'	NA
Iron ore		Syurenata deposit	Tashkentskaya Oblast'	NA
Lead, mine output, Pb content		Almalyk mining-metallurgical complex; Altyn-Topkan and Uchkulach deposits	Uchkulach deposit in Toshkent Wiloyati; Altyn-Topkan deposit in Kurama mountain range in Tajikistan (in March 1999, Altyn-Topkan transferred to control of Tajikistan)	40,000 [3]
Manganese		Dautashskoye deposit	Kashkadar'inskaya Oblast'	40,000
Molybdenum:				
Mine output, Mo content		Almalyk mining-metallurgical complex; Kalmakyr and Sarycheku deposits	Toshkent Wiloyati	900 [3]
Metal		Uzbek refinery and hard metals plant	Chirchiq	NA
Natural gas liquids	million cubic meters	Mubarek gas processing plant	Muborak	28,000
Do.		Shurtan gas-chemical complex	Shurtan-Say deposit, Kashkad'ya Region	137,000
Natural gas	million cubic meters	Gazli, Kandym, Khauzak, Kokdumalak, Pamuk, and Shurtan-Say deposits (major)	Amu-Dar'ya Basin; Mubarek area	70,000 [3]
Do.		Itera/Lukoil (Russia), Uzbekneftegaz JSC	Kan-Dam field	NA
Natural gas condensate		Trinity Energy (United Kingdom)	Ustyurt Plato Region	NA

See footnotes at end of table.

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TABLE 70—Continued
UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Petroleum:			
Crude	Kokdumalak and Mingbulak deposits (major)	NA	9,000,000 [3]
Refinery products	Fergana oil refinery	Farghona Region	8,800,000
Do.	Bukhara oil refinery	Bukhoro	2,500,000
Phosphate	Kyzyl Kum complex	Dzheroy-Sardarin Moroccan type; Karaktay, Severnyy and Dzhetymtau deposits	NA
Polyethylene	Shurtan gas-chemical complex	Shurtan-Say deposit, Kashkad'ya Region	125,000
Potash	Tyubegatan deposit	Southern Uzbekistan	NA
Silver	Kosmanachi, Okzhetpes, and Vysokovoltnoye deposits	Namanganskaya Oblast'	NA
Steel, crude	Bekabad steel mill	Bekabad	1,100,000
Sulfur	Mubarek gas processing plant complex	Muborak	2,000,000
Tungsten:	Deposits:		1,200 [3]
Mine output, W content	Koytash deposit	Northeastern Uzbekistan	
	Ingichka, Lyangar deposits	Zirabulak Mountains	
	Ugat deposit	Northern Uzbekistan	
Mine output, WO_3 content (0.49%)	Sautbay wolframite deposit	Kyzylkum Region	NA
Metal	Uzbek refractory and hard metals plant	Chirchiq	NA
Uranium, U content	Naviazot mining-metallurgical complex	Navoiy Region	3,000
Vermiculite square meters	Tebin-Bulak deposit	NA	25,000

[e]Estimated; estimated data are rounded to no more than three significant digits. NA Not available.

[1]Table includes data and information available through December 2006.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

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THE MINERAL INDUSTRIES OF DENMARK, THE FAROE ISLANDS, AND GREENLAND

By Chin S. Kuo

DENMARK

Denmark has an industrialized market economy that grew by 3.4% in 2005 in terms of the gross domestic product (GDP). The country's per capita GDP based on purchasing power parity was among the highest in the world at $34,737 (International Monetary Fund, 2006§[1]). The country's economic growth depended on imported raw materials and foreign trade. Demark exported energy, food products, instruments, and machinery. The extraction of oil and gas from the North Sea was very active. The country has no metallic mineral resources but does have large reserves of industrial minerals.

The Government launched its sixth oil and gas licensing round in May; this round was to focus on the western part of the Danish North Sea. Tenders were due by November 1. Seventeen applications from 20 companies were submitted by the due date. The Government was to take a 20% share of each license. A new Government business unit would hold the Government's share. The area had an estimated potential resource of 1.289 billion barrels of oil and 152 billion cubic meters of gas. A new oil find with good production rates, such as ConocoPhillips Company's Herje-2 exploration well, could significantly increase the resource. Drilling at Herje-2 hit oil in pre-Jurassic levels at a depth of 5,399 meters (m) below sea level. Oil discovery at depth with good production levels indicated that porosity was greater than previously proven (Alexander's Gas & Oil Connections, 2005§).

Internet References Cited

Alexander's Gas & Oil Connections, 2005 (March 1), Denmark may launch oil and gas licensing round by June, accessed April 11, 2005, at URL http://www.gasandoil.com/goc/news/nte51268.htm.

International Monetary Fund, 2006 (April), Denmark, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Major Source of Information

Geological Survey of Denmark and Greenland
Thoravej 8
DK – 2400 Copenhagen NV, Denmark
Telephone: 45 38 14 20 00
Fax: 45 38 14 20 50
E-mail: geus@geus.dk

FAROE ISLANDS

The Faroese economy depended on fishing and salmon farming and was aided by a substantial annual subsidy from Denmark. Potential discoveries of oil in the Faroese area gave hope for eventual oil production and diversification of its economy. Foreign oil companies were engaged in geophysical exploration and well drilling offshore. The Faroe Islands have no significant mineral resources.

Under the second Faroese licensing round, the Ministry of Trade and Industry awarded seven exploration licenses to eight oil companies in January. The license terms varied from 3 to 8 years and were divided into shorter sub-phases of 1 to 5 years with intermediate decision points. A firm work program was agreed for the first phase. The work programs covered seismic and other surveys as well as processing and interpretation. Two of the licenses contained stipulations on exploration wells for the subsequent phases of the license (Rigzone.com, 2005b§).

In January, the Faroese authorities awarded Denmark's state energy company DONG A/S interests in two new licenses on the Faroese continental shelf that were awarded to two consortia operated by ChevronTexaco Corporation of the United States and Statoil ASA of Norway, respectively. The area between the Faroe Islands and the Shetland Islands was one of DONG's three geographical focus areas for exploration. DONG made a significant discovery—Rosebank/Lochnagar—which is located in the United Kingdom's sector immediately across the boundary (Rigzone.com, 2005a§).

P/F Atlantic Petroleum signed an agreement with License 006 Group and the Faroese Petroleum Administration of the Ministry of Trade and Industry that a new commitment to drill on license 006 would be undertaken in lieu of fulfilling existing well commitments of license 001 and license 003 on the Faroe continental shelf. The company agreed to participate provided it was required to assume only a very small share of the cost and risk in license 006. License 006 Group was to drill the well in the summer of 2006 and consisted of Statoil (27.15%, as operator), DONG (21.91%), Anadarko Petroleum Corporation (13%), Enterprise Oil plc (12.47%), Amerada Hess Corporation (11.09%), BG Group (10.31%), Faroe Petroleum plc (4.04%), and Atlantic Petroleum (0.025%) (Huginonline.com, 2005§).

Internet References Cited

Huginonline.com, 2005 (December 8), Agreement makes a new phase in the oil exploration of the Faroe shelf, accessed December 8, 2005, at URL http://hugin.info/136963/R/1024733/162595.pdf.

Rigzone.com, 2005a (January 20), DONG awarded interests in two new Faroese licenses, accessed January 21, 2005, at URL http://www.rigzone.com/news/article.asp?a_id=19616.

Rigzone.com, 2005b (January 17), Faroe Minister of Trade & Industry announces license awards, accessed January 18, 2005, at URL http://www.rigzone.com/news/article.asp?a_id=19491.

[1]References that include a section mark (§) are found in the Internet References Cited sections.

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GREENLAND

Greenland covers about 2,166,000 square kilometers (km^2) and had a population of only 57,000 in 2005. The country is a self-governing overseas administrative division of Denmark. About one-half of the Government revenues came from grants from the Danish Government. The public sector also contributed to Greenland's economy. Hydrocarbon and mineral exploration activities were the focuses of foreign investment. Exploration was most active for base metals, diamond, gold, nickel, and platinum-group metals.

Galahad Gold plc reported the results of resource estimates for its Skaergaard gold/palladium/platinum project in eastern Greenland. Galahad completed eight diamond drill holes for a total of 5,494 m of drilling between July and September 2004. The gold and palladium zones were determined using a grade and thickness cutoff of 2.5 grams per metric ton (g/t) palladium-equivalent over a 2-m vertical width. The spacing between the gold and palladium zones varied in a systematic manner across the deposit. Inferred resources in the combined zone were estimated to be 1,520 million metric tons (Mt) at grades of 0.21 g/t gold, 0.61 g/t palladium, and 0.04% platinum. The Skaergaard intrusion contained several layers that were enriched with gold, palladium, and platinum. In addition, a recoverable magnetite content of 7.5% and an ilmenite content of 6% titanium dioxide were reported in the combined zone. A scoping study for the project would be completed in March 2006. Galahad Gold decided to stop funding the project and to relinquish the license to the Greenland authorities in 2005, however, owing to soaring capital and energy costs (Galahad Gold plc, 2005§).

International Molybdenum plc (InterMoly), which was a subsidiary of Galahad Gold, announced new mineral resource estimates for the Malmbjerg molybdenum project in eastern Greenland. The deposit contained measured and indicated resources of 217 Mt at a grade of 0.20% MoS_2 and an inferred resource of 12 Mt at a grade of 0.15% MoS_2 using a cutoff grade of 0.12% MoS_2. The capital cost of the project was estimated to be approximately $605 million for a 15,000-metric-ton-per-day operation that would produce 14,600 metric tons per year of molybdenum concentrate at a grade of 50% molybdenum. The lifespan of the mine would be 15 to 20 years. InterMoly owned 100% of the Malmbjerg project. A feasibility study was scheduled for completion in March 2006. Another project owned by InterMoly, the Flammefjeld prospect, had the potential to host significant molybdenum resources and was to be the subject of a drilling program in 2005 (International Molybdenum plc, 2005§).

In 2005, Inco Ltd. of Canada completed a drill program on Diamond Fields International Ltd.'s Ammassalik nickel project in eastern Greenland to evaluate nickel showings and geophysical targets. The claim block consisted of two adjacent properties that had a combined area of 63,737 hectares (ha); it was found earlier to have associated copper, nickel, and platinum-group metal mineralization. Results were not encouraging and led Inco to a decision to withdraw before vesting and thereby to retain no interest in the project. Diamond Fields was assessing its data and the Inco report to determine if further exploration was warranted. Subsequently, Diamond Fields concluded an agreement with Inco regarding the Ammassalik block. The agreement granted Inco the option to earn a 65% interest in the block by spending up to $3 million by the end of 2008 (Diamond Fields International Ltd., 2005, 2006).

According to a prefeasibility report, Angus & Ross plc indicated the viability of reopening its Black Angel Mine in western Greenland based on recovering a minimum of 985,000 metric tons (t) of ore grading at least 22% of combined zinc and lead with additional silver. The first ore could be shipped during construction, possibly in 2006. The mine was closed in 1990 and last inspected in 1997. Angus & Ross planned an extensive drilling program in the area beginning in June 2006. The chances were high of increasing the proven and recoverable reserves by further exploration and development of many satellite ore bodies discovered by Teck Cominco Ltd. and Boliden AB. Angus & Ross discovered an outcrop of satellite zinc ore that became visible owing to the disappearance of part of a glacier. In July 2005, the company acquired a 16% stake in the mine (Angus & Ross plc, 2005§).

In March 2005, Metalex Ventures Ltd. discovered strong counts of exceptional diamond indicator minerals (garnets) in two samples on the southern shore of Garnet Lake in Greenland. The garnets were considered to be derived from a nearby diamondiferous kimberlite pipe source. In June, ground geophysical work that identified 14 magnetic targets was completed, a program of heavy mineral sampling was carried out, and 16 holes were drilled across the lake to collect basal till samples. The drill holes continued into bedrock and some intersected thin kimberlite-like sills. Cantex Mine Development Corp. had an option to acquire a 25% interest in three Greenland licenses, including the area mentioned above (Cantex Mine Development Corp., 2005§).

Hudson Resources Inc. began its 2005 Greenland diamond exploration program with a ground geophysical survey of 120 line kilometers of magnetic data and 30 line kilometers of electromagnetic data. Drilling was expected to begin in mid-March. The areas were Garnet Lake, where a diamondiferous kimberlite was discovered, and Spider Lake, where diamondiferous kimberlite dikes radiated from a deep-seated circular anomaly. Significant diamond recoveries were from four locations in the Garnet Lake area and a new area that is located 12 kilometers (km) northeast of Garnet Lake (Hudson Resources Inc., 2005a, b).

New Millennium Resources Ltd. and Hudson Resources reported that kimberlite was intersected at 18 of the 19 holes (1,450 m) drilled in their drilling program on the Garnet Lake kimberlite in West Greenland. The presence of significant in situ kimberlite was associated with a prior diamond discovery. The joint venture planned to drill an additional 500 m of core in the 2005 field program. New Millennium had a 20% free-carry interest in the joint venture (New Millennium Resources Ltd., 2005§).

Ivigtut, which is located on the western side of Greenland's southern tip, is a mineral-rich area where the Ilimaussaq complex intruded in the Kanerdluarssuk Fjord. The most common gemstones were greenlandite, nuummite, and tugtupite.

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In addition, chalcedony, lazurite, and sodalite also were found. True North Gems Inc. of Canada acquired the 5,500-ha Fiskenaesset ruby property, which is located 160 km south of Nuuk in the Qeqertarsuatsiaat district. The property had been in intermittent exploration and small-scale production. A total of 50 t of high-grade ruby ore has been recovered there since 1953 (Colored Stone, 2005).

In 2005, the Government granted a new exploration and exploitation license for hydrocarbons to EnCana Corp. of Canada and Nunaoil A/S of Greenland from the 2004 licensing round. The license area covered 2,897 km^2 and is located 250 km west of Nuuk offshore West Greenland. EnCana was to hold 87.5% of the license and act as operator and Nunaoil would hold 12.5%. EnCana was the operator of the Atammik license offshore West Greenland, which was awarded in the 2002 licensing round (Rigzone.com, 2005§).

References Cited

Colored Stone, 2005, Frozen potential: Colored Stone, v. 18, no. 1, January/February, p. 46.

Diamond Fields International Ltd., 2005, Diamond Fields announces appointment of new CFO and Inco's withdrawal from Greenland nickel project: Vancouver, British Columbia, Canada, Diamond Fields International Ltd. news release, December 28, 2 p.

Diamond Fields International Ltd., 2006, Greenland: Vancouver, British Columbia, Canada, Diamond Fields International Ltd. annual report, p. 7.

Hudson Resources Inc., 2005a, Hudson finds larger diamonds at Garnet Lake and confirms new diamond area: Vancouver, British Columbia, Canada, Hudson Resources Inc. news release, December 1, 1 p.

Hudson Resources Inc., 2005b, Hudson initiates 2005 Greenland diamond program: Vancouver, British Columbia, Canada, Hudson Resources Inc. news release, February 28, 1 p.

Internet References Cited

Angus & Ross plc, 2005 (November 29), Chairman's interim statement, accessed November 29, 2005, via URL http://www.angusandross.com/AR-NEW/pages/annual-rep.htm.

Cantex Mine Development Corp., 2005 (November 29), Greenland update, accessed November 29, 2005, at URL http://cnxmarketlink.com/en/release/archive/November2005/29/c095.

Galahad Gold plc, 2005 (October 28), Skaergaard project resource estimates announced, accessed October 28, 2005, via URL http://www.galahadgold.com/mediacentre/narchive.html.

International Molybdenum plc, 2005 (November 17), Upgrade of molybdenum resources, accessed November 17, 2005, at URL http://www.intermoly.com/record.jsp?type=news&ID=10.

New Millennium Resources Ltd., 2005 (May 16), JV partner Hudson intersects kimberlite at Garnet Lake, West Greenland, accessed May 17, 2005, at URL http://www.new-millennium.com.au/download/news/drilling_programme_on_garnet_lake_kimberlite_in_greenland_pdf.pdf.

Rigzone.com, 2005 (January 20), EnCana awarded exploration license offshore West Greenland, accessed January 21, 2005, at URL http://www.rigzone.com/news/article.asp?a_id=19622.

Major Source of Information

Bureau of Minerals and Petroleum
P.O. Box 930
DK – 3900 Nuuk, Greenland
Telephone: 299 34 68 00
Fax: 299 32 43 02
E-mail: bmp@gh.gl

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TABLE 1

DENMARK: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
Aluminum metal, secondary		18,000	18,000	18,000	20,000	20,000
Cement, hydraulic		2,047,000 [3]	2,010,000	2,020,000	2,050,000 [r]	2,070,000
Chalk		1,859,000 [3]	1,900,000	1,900,000	1,950,000	1,950,000
Clays:						
Fire clay		25	25	25	25	25
Kaolin		2,500	2,500	2,500	2,500	2,500
Other		6,500	6,000	6,000	6,000	5,500
Moler, extracted	thousand cubic meters	231	230	232	233	234
Gas:						
Manufactured	million cubic meters	1,500	1,500	1,500	1,500	1,500
Natural:						
Gross	do.	8,200	8,100	8,300	9,000 [r]	9,500
Marketable	do.	7,330	7,300	7,300	8,200 [r]	9,200
Iron and steel, metal, steel:						
Crude	thousand metric tons	746 [3]	392 [3]	-- [3]	-- [3]	-- [3]
Semimanufactures	do.	625 [3]	600	300	300	250
Lime, hydrated and quicklime		115,000	114,000	115,000	116,000	120,000
Natural gas plant liquids	thousand 42-gallon barrels	47,000	46,700 [3]	46,000	47,000	48,000
Nitrogen, N content of ammonia		1,600	1,600	1,600	1,600	1,600
Peat		287,000	290,000	295,000	296,000	298,000
Petroleum:						
Crude	thousand 42-gallon barrels	123,800 [3]	132,900 [3]	133,000 [3]	135,000	131,000
Refinery products:						
Liquefied petroleum gas	do.	1,224 [3]	1,195 [3]	1,232 [3]	1,240	1,250
Gasoline	do.	16,496 [3]	15,205 [3]	15,264 [3]	15,300	15,400
Naphtha	do.	13,000	-- [3]	--	--	--
Jet fuel	do.	3,981 [3]	3,878 [3]	4,479 [3]	4,500	4,800
Distillate fuel oil	do.	23,606 [3]	23,886 [3]	25,300 [3]	25,500	26,000
Refinery gas	do.	2,221 [3]	2,141 [3]	2,331 [3]	2,300	2,200
Residual fuel oil	do.	11,488 [3]	11,540 [3]	11,136 [3]	11,000	11,300
Total	do.	72,000	57,845 [3]	59,700 [3]	59,800	61,000
Phosphates, crude, gross weight		1,300	1,300	1,400	1,400	1,400
Salt, all forms		600,000	600,000	605,000	610,000	610,000
Sand and gravel:						
Onshore	thousand cubic meters	26,684 [3]	27,000	27,000	28,000	28,400
Offshore	do.	700	700	600	600	600
Total	do.	27,384 [3]	27,700	27,600	28,600	29,000
Of which sand, industrial (sales)	do.	488 [3]	490	500	500	500
Stone:						
Dimension (mostly granite)		27,000	25,000	26,000	26,000	27,000
Limestone:						
Agricultural		700,000	700,000	700,000	700,000	700,000
Industrial		250,000	250,000	250,000	250,000	250,000
Sulfur, byproduct		10,500	11,000	12,000	12,000	13,000

[r]Revised. -- Zero.

[1]Estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through July 5, 2006.

[3]Reported figure.

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The Mineral Industries of Estonia, Latvia, and Lithuania

By Chin S. Kuo

ESTONIA

Estonia is a gateway and transshipment point between Eastern and Western Europe. Its economy in terms of the gross domestic product (GDP), which had grown steadily in recent years, grew by 9.8% in 2005. Inflation was low at 4.1% (International Monetary Fund, 2006§[1]). Estonia exported goods and services to and imported petroleum products from Western Europe and Russia. The country was nearly energy independent and supplied more than 90% of its electricity demand with locally mined oil shale. In addition to oil shale, Estonia produced peat and industrial minerals. The Government privatized state-owned firms, except the Port of Muuga and the powerplants, and planned to attract foreign direct investment.

In February, the Estonian Parliament adopted the Environmental Impact Assessment and Environmental Management System Act. The new act specifies the procedures and principles of environmental impact assessment, taking a broader and more indepth approach to the issues than was previously the case. The new act makes strategic environmental assessment mandatory in the case of general plans and national, county, and local plans and programs. The procedure of environmental impact assessment also is improved, leading to more transparency and fewer disputes. The act entered into force on April 3 (Raidla & Partners, 2005§).

Dry Bulk Terminal at the Port of Muuga was expanding its dry bulk fertilizer storage by 26,000 metric tons (t) through the construction of a new storage dome to be completed in January 2006 at a cost of $4.72 million. The expansion would increase storage capacity at the port to 165,000 t. Russia's JSC Acron planned to build an ammonia terminal in Estonia at a cost of between $25 million and $30 million. The company's Novgorod plant was being upgraded to produce 700,000 metric tons per year (t/yr) of ammonia in the first quarter of 2008 (Fertilizer Week, 2005).

Reference Cited

Fertilizer Week, 2005, Muuga expands fertilizer port facilities: Fertilizer Week, v. 19, no. 33, December 2, p. 3.

Internet References Cited

International Monetary Fund, 2006 (April), Estonia, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Raidla & Partners, 2005 (July, 19), Recent developments in Estonia, accessed July 21, 2005, via URL http://www.mondaq.com/article.asp?articleid=33799&email_access.

[1]References that include a section mark (§) are found in the Internet References Cited sections.

LATVIA

Because of Latvia's geographic location, it serves as an important East-West commercial and trading center in the region. Its economy performed very well in 2005, with a GDP growth of 10.2%. The per capita GDP based on purchasing power parity grew steadily to $12,622, and inflation remained moderate at 6.7% (International Monetary Fund, 2006§). The country's mineral industry was small and its steel mill at Liepaja had a production capacity of 550,000 t/yr of crude steel.

The Kirovo-Chepetsk ammonia plant resumed production in April 2005 following the decision by Gazprom of Russia to continue supplying gas. The legal dispute between Gazprom and other Russian gas producers was dragging on and could be a lengthy process. Natural gas in storage tanks at Ventspils was low and shortages could have developed if the dispute was not resolved in April (Fertilizer Week, 2005).

The Russian Government decided to reroute its coal trains from Siberian mines destined for the Port of Ventspils through Belarus. The direct route through Latvia to Ventspils was being used to transport cargoes of oil. The diversion of transport increased delivery costs for low-volatile Russian coals. The main European customers for low-volatile Russian coals were the Spanish utility companies (Platts, 2005§).

Reference Cited

Fertilizer Week, 2005, Daily update: Fertilizer Week, March 23, p. 3.

Internet References Cited

International Monetary Fund, 2006 (April), Latvia, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Platts, 2005 (May 11), Rail re-route hits Russian low vol, accessed May 14, 2005, at URL http://www.platts.com/Coal/News/1263040.xml?S=n.

LITHUANIA

Lithuania has the icefree Seaport of Klaipeda for transshipment of Russian minerals and oil. In 2005, the country's GDP grew by 7.3% owing to increased construction, retail and wholesale trade, and processing and light industries. Inflation was low at 2.6% (International Monetary Fund, 2006§). Lithuania's exports to the European Union countries represented 65% of its total exports, and those to the Commonwealth of Independent States, 18%. In the energy sector, the country produced a small amount of crude oil and operated the Mazeikiai refinery, which was the only oil refinery in the Baltic States.

Klasmann-Deilmann GmbH of Germany acquired three peat production operations in Lithuania. The raw materials were

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supplied to existing production facilities in Germany, Lithuania, and the Netherlands. The Ezerelis, the Paliai, and the Susis peat operations, which were located close to Kaunas, had a combined total of more than 2,000 hectares of raised peat bog fields. The operations employed approximately 190 workers. The substrate factory at Silute in Lithuania was among the most modern in the Baltic region and produced 400,000 cubic meters per year of growing media (Klasmann-Deilmann GmbH, 2005§).

Mazeikiu Nafta was forced to reduce production at its Mazeikiai refinery in April because of disruptions in crude oil supplies from Yukos of Russia, which had a dispute over tax claims with the Russian Government. The refinery planned to refine 9.5 million metric tons (Mt) of crude oil in 2005. Yukos held a 54% stake and management rights in the refinery. The Lithuanian Government owned 41%. The Russian pipeline monopoly Transneft decided not to allocate Yukos any crude exports to Mazeikiu in the first quarter of 2005. Transneft cut overall crude supplies from Yukos to Mazeikiu to 1.8 Mt in the second quarter and allocated 0.6 Mt from Lukoil of Russia to Mazeikiu. Lukoil entered negotiations with Yukos to buy Yukos' 54% stake in Mazeikiu (Petroleum Economist, 2005).

Reference Cited

Petroleum Economist, 2005, Battle is on to reclaim refinery: Petroleum Economist, v. 72, no. 5, May, p. 40.

Internet References Cited

International Monetary Fund, 2006 (April), Lithuania, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Klasmann-Deilmann GmbH, 2005 (April 18), Klasmann-Deilmann strengthens its raw-materials base in the Baltic region, accessed May 9, 2005, at URL http://pp.unix.de/klasmann2/pressedaten/main.php?sprache=GB&id=156.

TABLE 1
ESTONIA, LATVIA, AND LITHUANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2001	2002	2003	2004	2005
ESTONIA						
Cement		404,600	466,000	506,200	615,000	650,000
Clays:						
For brick	thousand cubic meters	119,800	149,200	134,900	136,600	135,000
For cement	do.	25,700	19,000	27,300	31,600	32,000
Lead, metal, secondary		--	--	--	3,000	7,000
Limestone for cement	cubic meters	300,000 e	366,200	372,200	430,500	435,000
Nitrogen, N content of ammonia		150,600	38,700	80,800	166,000	170,000
Oil shale	thousand metric tons	11,837	12,400	12,608	11,327	11,500
Peat	do.	844	1,508	1,012	764	800
Sand and gravel	thousand cubic meters	1,325	2,033	4,470	3,131	3,500
Silica sand, industrial	do.	31,600	22,500	41,300	49,800	52,000
LATVIA						
Cement		W	260,397	295,205	283,647	280,000 e
Gypsum		W	217,074	159,133	225,742	220,000 e
Limestone		W	393,285	431,590	443,987	420,000 e
Peat		555,003	1,484,970	1,076,142	823,938 r	675,866
Sand and gravel		688,904	761,614	1,981,431	1,875,494 r	1,441,680
Steel:						
Crude		W	507,194	545,626	553,684	550,000 e
Products		W	W	W	W	W
LITHUANIA[2]						
Cement		529,100	605,800	596,900	753,100	832,100
Limestone		894,000	984,300	944,600	1,385,600	1,242,200
Nitrogen, N content of ammonia		443,800	468,300	461,800	424,000	431,700
Peat		273,000	513,000	366,900	367,900	535,000
Petroleum:						
Crude		470,000	433,700	382,800	301,900	216,600
Refinery products		6,543,500	6,447,700	6,703,000	7,682,600	8,518,500

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. W Withheld to avoid disclosing proprietary data.

[1]Table includes available data through October 19, 2006.

[2]Lithuania produces other industrial minerals, which include clays and sand and gravel, but available information is inadequate to make reliable estimates of output.

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THE MINERAL INDUSTRY OF FINLAND

By Chin S. Kuo

Finland is an industrialized country whose economy was based primarily on exports, of which the engineering, electronics, and metals industries accounted for 50%, and the forest products industry, 30%. In 2005, a decrease in industrial activity slowed the gross domestic product (GDP) growth to 2.1%. Exports of goods and services contributed 33% of the GDP. Inflation remained low at 0.9% (International Monetary Fund, 2006§[1]). Finland has abundant forest resources and several metals (chromite, copper, nickel, and zinc) and industrial minerals (mostly limestone and phosphate rock). Exploration activities in 2005 focused on base metals, diamond, gold, industrial minerals, and platinum-group metals. The country depended on imported raw materials for its manufactured products and energy.

Vulcan Resources Ltd. of Australia began its prefeasibility study on the Kylylahti copper-cobalt-nickel-gold deposit near Outokumpu in eastern Finland. The company also initiated a review of all geologic and geophysical data to delineate drill targets for deposit extensions and adjacent new deposits. In September, the company began a 6,500-meter (m) diamond drilling program. The drill targets included the gap between the Wallaby and the Wombat zones, the lowermost margin of the Wallaby zone, and the infill drilling of the Wallaby zone. The deposit had an estimated resource of 3.4 million metric tons (Mt) at a grade of 1.8% copper, 0.3% cobalt, 0.2% nickel, and 1 gram per metric ton (g/t) gold with a metal content of 60,000 metric tons (t) of copper and 10,000 t of cobalt. Vulcan's vision was to develop an underground mine with a production of 300,000 metric tons per year (t/yr) to 400,000 t/yr (Vulcan Resources Ltd., 2005b).

With its joint-venture partner Cambrian Mining plc of the United Kingdom (40%), Vulcan Resources (60%) began a 3,500-m diamond drilling program at the Kuhmo nickel-copper project in eastern Finland. Drilling took place on a number of targets that encompass a more than 100-kilometer (km) length of the Kuhmo-Suomussalmi greenstone belt. Infill and extension drillings at the Hietaharrju and the Peura-aho deposits would be conducted. Tests of geologic, geochemical, and geophysical targets adjacent to the deposits also would be performed. Mineralization was hosted by a thick komatiite ultramafic unit and occurred at the base of the unit as massive nickel sulfide and vein deposits (Vulcan Resources Ltd., 2005a).

Tertiary Minerals plc completed the second phase of drilling at its Kaaresselka gold prospect in northern Finland. The program was designed to test the depth extent of high-grade gold mineralization in the Vanha lode, the southeastern extension of the Tienvarsi lode, and the high-grade near-surface mineralization at Lampi. Five holes were drilled for a total of 750 m, and a small program of trenching was carried out at Lampi (Tertiary Minerals plc, 2005a).

Talvivaara Mining Co. Ltd. in partnership with Metso Minerals planned a bankable feasibility study in 2006 of the Talvivaara polymetallic deposits at Sotkamo. Metso Minerals had resources for and technological knowledge of rock processing and bulk materials handling process development for bioheap leaching. The deposits contained 340 Mt of ore, which was the largest known sulfide nickel resource in Europe. The ore bodies also contained substantial amounts of cobalt, copper, and zinc. Talvivaara Mining planned to use the bioheap leaching technology in its ore beneficiation process (Metso Corp., 2005).

Gold Fields Limited of South Africa formed a joint venture with North American Palladium Ltd. (NAP) to restart the Arctic Platinum Project. The project had resources of 373,000 kilograms (kg) of platinum and included the SJ Reef, the SK Reef, and the Suhanko deposits and claims south of Rovaniemi in Finland. NAP could earn a 60% interest in the project by completing a $12.5 million exploration and feasibility study and paying Gold Fields $45 million worth of NAP shares when NAP decides to develop a mine (Business Report, 2005§).

Agricola Resources plc, which was a uranium exploration company, completed bedrock trench sampling at Hautajarvi in northern Finland. The company reported that in trench A, samples of 10 meters of bedrock and continuous channel samples gave an average value of 0.36% uranium oxide; samples of a 5-m section of trench C gave an average value of 0.16% uranium oxide. The first diamond drill hole was planned for October 2005. The second hole, which was to be angled at 45 degrees, would be drilled into the mineralization zone to test its thickness (Agricola Resources plc, 2005§).

Sunrise Diamonds plc of the United Kingdom, which was a wholly owned subsidiary of Tertiary Minerals plc, acquired the rights to the diamond interests in Finland held by Tertiary Minerals' wholly owned subsidiary Tertiary Gold Ltd. The interests comprised the rights to three kimberlites discovered by Tertiary Gold in 2004 in a previously unknown kimberlite cluster now known as the "Kuusamo cluster" and a portfolio of 45 untested kimberlite targets in the same general area (Tertiary Minerals plc, 2005b).

European Diamonds plc reported positive results from drill samplings at its new kimberlite discovery in the Area 3 exploration zone in central Finland. The compositions of pyrope and chromite from the kimberlite were highly prospective for diamond in the Finnish part of the Karelian craton. Exploration of the kimberlite and the mineral indicators in the near vicinity continued during the field season (European Diamonds plc, 2005).

In September, Neste Oil Corp. of Finland's Porvoo oil refinery was back onstream after 5 weeks of scheduled maintenance work. In addition to maintenance, work included a number of investments designed to enhance the refinery's productivity, such as expanding the lubricant component's production capacity. Work also involved modifications made to the cooling water, electric supply, flaring, and sulfur recovery systems as

[1]References that include a section mark (§) are found in the Internet References Cited section.

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part of the refinery's diesel project. Together with the refinery at Naantali, the company had a total refining capacity of 250,000 barrels per day (Neste Oil Corp., 2005b).

The initiation of Neste Oil's diesel project at the Porvoo refinery could increase the company's total refining margin for the production of 100 million barrels per year by more than $2 per barrel. However, the cost estimates for the project had been increased by 10% since the investment decision was made. The new diesel production line was expected to come onstream in late 2006. If the project proceeds as planned, production of heavy fuel oil will be reduced and the refinery will be able to switch to using heavier crude oil (Neste Oil Corp., 2005a).

References Cited

European Diamonds plc, 2005, Encouraging results of sampling from the Area 3 kimberlite in central Finland: St. Albans, United Kingdom, European Diamonds plc press release, September 19, 1 p.

Metso Corp., 2005, Metso to take part in Talvivaara Mine development as technological partner: Helsinki, Finland, Metso Corp. press release, December 1, 2 p.

Neste Oil Corp., 2005a, Changes in profitability and cost estimates of the diesel project at Porvoo refinery: Espoo, Finland, Neste Oil Corp. press release, August 4, 1 p.

Neste Oil Corp., 2005b, Neste Oil's Porvoo refinery back on stream following maintenance turnaround: Espoo, Finland, Neste Oil Corp. press release, October 3, 2 p.

Tertiary Minerals plc, 2005a, Second phase drilling at Kaaresselka extends higher grade gold mineralization at depth: London, United Kingdom, Tertiary Minerals plc press release, March 10, 2 p.

Tertiary Minerals plc, 2005b, Tertiary to spin-off Finnish diamond interests: London, United Kingdom, Tertiary Minerals plc press release, March 29, 2 p.

Vulcan Resources Ltd., 2005a, Nickel drilling program commences in Finland: West Perth, Australia, Vulcan Resources Ltd. news release, September 5, 1 p.

Vulcan Resources Ltd., 2005b, Pre-feasibility study commenced Kylylahti copper-cobalt deposit, Finland: West Perth, Australia, Vulcan Resources Ltd. news release, January 12, 2 p.

Internet References Cited

Agricola Resources plc, 2005 (October 17), Results of trenching at Energy Ridge, Hautajarvi, Lapland County, northern Finland, Press Release, accessed November 30, 2005, at URL http://www.agricolaresources.com/pressrelease17oct.html.

Business Report, 2005 (October 20), Gold Fields dusts off Arctic project, accessed October 24, 2005, at URL http://www.busrep.co.za/index.php?fSectionId=563&fArticleId=2954295.

International Monetary Fund, 2006 (April), Finland, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Major Source of Information

Geological Survey of Finland
Betonimiehenkuja 4
02150 Espoo
Finland

TABLE 1
FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS						
Aluminum, metal, secondary	metric tons	34,488	31,076	32,619	39,266	42,061
Cadmium, metal, refined	do.	604	4	--	--	-- [e]
Chromite:[e]						
Gross weight:						
Lump ore		215	216	210	240 [r]	235
Concentrate		350	340	329	330	326
Foundry sand		10	10	10	10	10
Total		575 [3]	566	549	580 [r, 3]	571 [3]
Cr_2O_3 content:						
Lump ore		75	75	76	84 [r]	82
Concentrate		130	125	125	127 [r]	126
Foundry sand		5	5	5	5	5
Total		210	205	206	216 [r, 3]	213 [3]
Cobalt, metal, powder and salts	metric tons	3,908	4,292	4,574	5,246	6,158
Copper:						
Concentrate, gross weight	do.	41,146	50,494	50,875	52,864	53,489
Mine output, Cu content	do.	13,715	14,400	14,900	15,500	15,600 [e]
Metal:						
Smelter	do.	169,300	160,900	176,384	168,577	177,216
Refined	do.	119,677	127,136	135,160	132,133 [r]	91,187
Gold, metal, mine output	kilograms	5,552	4,666	5,409	6,222 [r]	3,747

See footnotes at end of table.

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TABLE 1--Continued
FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005
METALS--Continued						
Iron and steel, metal:						
Pig iron		2,852	2,828	3,092 r	1,042 r	3,522
Ferroalloys, ferrochromium		237	248	250 e	264 r	235
Steel, crude		3,938	4,004	4,766	4,833	4,738
Semimanufactures, rolled e		3,800	3,850	3,900	3,950	4,000
Mercury	metric tons	71	51	25	24	15
Nickel:						
Mine output, Ni content	do.	27,610	41,797	39,375	44,496	40,897
Metal, electrolytic	do.	51,275	49,151	45,417	40,088	34,709
Platinum	kilograms	510	508	461	705	678
Selenium, metal	do.	38,913	39,237	49,163	61,250 r	57,208
Silver, metal	do.	23,998	29,404	31,115	37,413	24,822
Zinc:						
Mine output, Zn content	metric tons	36,253	61,580	70,652	69,333	72,474
Metal	do.	247,179	235,337	265,853	284,524	281,905
INDUSTRIAL MINERALS						
Cement, hydraulic		1,325	1,198	1,493	1,691	1,321
Feldspar	metric tons	34,298	46,715	48,353	57,149	58,000 e
Lime		333	350	434	432	440
Nitrogen, N content of ammonia	metric tons	80,000 e	87,000	77,100	60,600	59,100
Phosphate rock, apatite concentrate: e						
Gross weight	do.	750 r	800 r	799 r	838 r	823 3
P_2O_5 content	do.	277 r	270 r	290 r	306 r	300
Pyrite, gross weight		632	727	677	702	489
Sodium sulfate		30	30	28	27	26
Stone, crushed:						
Limestone and dolomite:						
For cement manufacture		1,400 e	1,400 e	1,411 r	1,628 r	1,537
For agriculture		1,000 e	1,000 e	626 r	555 r	566
For lime manufacture		350 e	400 e	424 r	316 r	342
Fine powders		350 e	400 e	579 r	670 r	629
Metallurgical e		1	1	1	1	1
Total		3,100 e	3,200 e	3,041 r	3,170 r	3,075
Quartz silica sand		148	148	112	285 r	286
Sulfur:						
S content of pyrite		337	359 r	341 r	336	350 e
Byproduct:						
Metallurgy		227 r	308 r	305 r	301	300 e
Petroleum		46 r	55 r	60	65 r	70 e
Total		273 r	363 r	365 r	366 r	370 e
Sulfuric acid		923	951	1,036	1,141	1,057
Talc		418	416	460	492 r	542
Wollastonite		20,000 e	20,000 e	17,300 r	16,763 r	15,950
MINERAL FUELS AND RELATED MATERIALS						
Peat:						
For fuel use		5,368	6,515	8,415	8,159	7,696
For agriculture and other uses		834	759	929	905	778
Petroleum refinery products	thousand 42-gallon barrels	42,318	54,801	54,956	61,037	78,796

eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. rRevised. -- Zero.

[1]Table includes data available through July 25, 2006.

[2]In addition to the commodities listed, granite and soapstone were produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

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TABLE 2
FINLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Ammonia		Kemira Oyj (Government, 98%)	Plant at Oulu	75
Apatite		Kemira Agro Oy (Government, 98%)	Mine and plant at Siilinjarvi	8,000
Cadmium, metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	1
Cement		Finncement Oy (Irish Cement Ltd., 100%)	Plants at Lappeenranta and Parainen	1,020
Chromite		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Kemi	1,000
Copper:				
Ore, Cu content		Inmet Mining Corp.	Mines at Pyhasalmi, Saattopora, and Hitura	10
Metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Harjavalta	160
Do.		do.	Refinery at Pori	125
Feldspar		SP Minerals Oy (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mine and plant at Kemio	50
Ferrochrome		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Tornio	250
Gold:				
Ore, Au content	metric tons	do.	Mine at Orivesi	4
Do.	do.	ScanMining	Pahtavaara Mine near Sodankyla	3
Metal	do.	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Pori	4
Limestone		Partek Nordkalk Oy (Partek Corp., 100%)	Mines at Lappeenranta, Pargas, and Parainen	1,500
Do.		Rauma-Repola Oy	Mine at Tornio	300
Mercury	metric tons	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	150
Mica		Kemira Oyj (Government, 98%)	Mine at Siilinjarvi	10
Nickel:				
Ore, Ni content		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Hitura	3
Metal		do.	Smelter at Harjavalta	32
Do.		OM Group, Inc.	Refinery at Harjavalta	50
Petroleum products		Fortum Oil and Gas Oy	Plants at Naantali and Porvoo	NA
Phosphate-apatite		Kemira Oyj (Government, 98%)	Mine at Siilinjarvi	700
Do.		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Pyhasalmi	800
Quartz and quartzite		SP Minerals Oy (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mines at Kemio and Nilsia	250
Selenium	metric tons	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Pori	35
Silver	do.	do.	do.	30
Steel:				
Crude		Rautaruukki Oy (Government, 41.8%)	Plants at Halikko, Hameenlinna, Kankaanpaa, and Raahe	2,100
Do.		Fundia AB (Norsk Jenverk AS of Norway, 50%, and Rautaruukki Oy, 50%)	Plants at Aminnefors, Dalsbruk, and Koverhar	850
Do.		Ovako Oy (SKF, 50%; Wartsila, 25%; Fiskas, 20%)	Plant at Imatra	600
Stainless		AvestaPolarit	Plant at Tornio	550
Talc		Mondo Minerals Oy (BHP Billiton Group, 50%, and Plüss-Staufer AG, 50%)	Mines at Lahnaslampi, Lipsavaara, and Horsmanaho	500
Wollastonite		Partek Minerals Oy (Partek Corp., 100%)	Mine at Lappeenranta	30
Zinc:				
Ore, Zn content		Inmet Mining Corp.	Mine at Pyhasalmi	25
Metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	260

NA Not available.

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THE MINERAL INDUSTRY OF FRANCE

By Harold R. Newman

France was a major European mineral producer and the world's sixth ranked industrialized economy in terms of the gross domestic product (GDP). The country was in transition from a modern economy that had featured extensive Government ownership and intervention to one that relied more on market mechanisms. The country had partially or fully privatized many large companies; the Government, however, remained dominant in some sectors, particularly the power sector. The Government was working on a decentralization program that would transfer many central Government responsibilities to the regions, provinces, and cities. In accordance with European Union (EU) requirements, the Government continued to reduce the subsidies given to uneconomic mineral operations (U.S. Central Intelligence Agency, 2006§[1]).

France had a population of 60.9 million in 2005 and has a land area of 545,630 square kilometers, not including its overseas administrative divisions. In 2005, the GDP based on purchasing power parity was $1.8 trillion, which was the second largest in the EU, and the per capita income based on purchasing power parity was $29,019. The inflation rate was 2.1%, and the unemployment rate was 9.9%. Reserves of foreign exchange and gold were estimated to be $74.4 billion (International Monetary Fund, 2005§).

Government Policies and Programs

Progress in privatization has been made through the implementation of EU liberalization and deregulation directives. Regulatory reform by the Government has reduced the role of the state in the economy and has largely opened the country's markets to competition. Efforts were continuing to promote the private sector and to reduce the dependence of state-owned companies on subsidies.

The Government announced plans for an initial public offering (IPO) of shares in Electricite de France S.A. (EdF), which was the state-owned power company. The midyear IPO of 22% of Gaz de France S.A. (GdF) brought in €2.5 billion ($3.1 billion[2]) for the Government and €2 billion ($2.5 billion) for GdF to accelerate its foreign expansion program (The Business Online, 2005§).

Environmental Issues

The Ministère de l'Écologie et du Développement Durable was responsible for regulating key environmental issues which included agriculture runoff, air pollution from industrial and vehicle emissions, forest damage from acidic rain, mining, mineral processing, and water pollution from urban wastes. The Government was committed to reducing toxic emissions and to enforcing regulations that concern transportation of hazardous materials (U.S. Central Intelligence Agency, 2006§).

Production

Metal and mineral industries generally maintained production and other activities at about the same rate and/or rate of decline as that of 2004 (table 1). The bauxite, coal, gold, iron ore, potash, and uranium mining sectors and the magnesium metal refining sector closed their operations owing to the depletion of commercial grade reserves, higher operating costs, or cheaper foreign sources.

Some bauxite waste dumps in the Languedoc region were reprocessed; the resulting product was used by cement companies to correct the iron content of cement. Changing conditions have required the closing of some mineral mining and refining operations.

Trade

In general, EU agreements and practices determine France's trade policies. Strong commercial relations continued between France and the United States; Germany remained France's leading export destination. On the basis of the quantity of exports and imports, France was the third ranked trading partner in Europe after the United Kingdom and Germany, and the ninth ranked trading partner of the United States worldwide. The total value of exports in 2005 was $439.2 billion, and that of imports was $471.4 billion, which resulted in a trade deficit of $32.2 billion (The Economist, 2006§).

Structure of the Mineral Industry

Companies, such as Acelor Group, Alcan Inc., Ceca S.A., Lafarge S.A., explored for new domestic and international mineral resources, conducted research, and produced minerals and mineral products. Adjustment to the single European market resulted in mergers, closures of operations, and cooperative ventures as companies sought ways to obtain competitive advantages (table 2).

Commodity Review

Metals

Aluminum.—Alcan Inc. of Canada announced that it would start closing its 43,000-metric-ton-per-year (t/yr) smelter at Lannemezan, Hautes-Pyrenees Province, in mid-2006. The closure was expected to be completed by 2008. The plant had become a high-cost facility owing to its age, geographic location, size, and technology. The Lannemezan smelter

[1]References that include a section mark (§) are found in the Internet References Cited section.

[2]Where necessary, values have been converted from EU euros (€) to U.S. dollars ($) at the rate of €1.00=$1.24.

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produced about 1% of Alcan's primary metal output (Mining Journal, 2005a).

Gold.—Mines d'Or de Salsigne's underground Salsigne Mine near Carcassonne had been closed since 2002. It remained closed and was on care and maintenance status at yearend 2005.

Lead and Zinc.—A ruling by the French Court of Appeals in favor of Metaleurop S.A. ended almost 3 years of legal wrangling with receivers after the collapse of subsidiary Metaleurop Nord's Noyelles Godault lead and zinc plant in January 2003. The latest ruling meant that Metaleurop would operate according to a "continuation plan," which is similar to a U.S. Chapter 11 bankruptcy plan, that was filed with the Commercial Court in September 2005. The plan outlined a strategy for the company to pay off its remaining debt to creditors (Metal Bulletin, 2005).

The Umicore Group announced that it had decided to concentrate the strategic focus of its zinc division fully on the production and sale of zinc specialty products. This entailed discontinuing the sale of commodity zinc, which was mainly sold to the steel industry. Umicore planned to focus on development of products with higher added value and on the recycling of various zinc-bearing products. Umicore's zinc division was the world's leading zinc recycler (Umicore Group, 2005§).

Industrial Minerals

Cement.—Lafarge S.A. and Société des Ciment Français were the two leading producers of cement in France. Lafarge invested €25 million ($31 million) in a new slag-grinding plant with a capacity of 300,000 t/yr. The plant would be located at the Port of Bordeaux in Bassens and was scheduled to be operational in early 2007 (Lafarge Group, 2005§).

Clay and Shale.—Imerys Group acquired Denain-Anzin Minéraux (DAM) from Nord Est in October 2005 for €55.7 million ($69 million). Imerys was strengthening its European kaolin base and also adding other mineral sources. How Imerys would fit the DAM operations into its expanded series of business operations was not clear. Despite DAM's production of certain grades of kaolin used by the paper industry, the new operations would more likely fall into the specialty minerals business group, which covered the ceramics and fillers markets. The paper market represented only a small part of DAM's business; ceramics and glass were the main markets (Industrial Minerals, 2005a).

Gypsum.—France was one of Europe's major producers of gypsum. Two-thirds of the production was from the Paris Basin. S.A. de Materiel de Construction was the leading producer.

Salt.—Compagnie des Salins du Midi et des Salines de l'Est (Salins du Midi) was the French entity of the Salins Group. The Group was a leading European salt producer with production sites in France, Italy, and Spain. Salins du Midi had production sites in Aigues Mortes, Dax, Salin de Giraud, and Varangeville and produced about 2.5 million metric tons per year (Mt/yr) of salt (Salins Group, 2005§).

Talc and Pyrophyllite.—In 2005 Talc de Luzenac S.A. celebrated its first 100 years of operation. The company was the operator of the world's largest talc deposit at Luzenac, Ariege. Talc de Luzenac mined talc from the Trimouns quarry in the Pyrenees and was the only open pit talc mine in operation in France in 2005. Talc de Luzenac produced about 400,000 t/yr of talc and had estimated reserves for 100 additional years of operation (Industrial Minerals, 2005b).

Mineral Fuels and Related Materials

France has few indigenous energy sources, which include only small amounts of coal, natural gas, and petroleum. The exploitation of these resources has steadily decreased during the past two decades, and nuclear power has dominated the energy supply sector. French energy policy has been relatively consistent with the main objectives of securing energy supply, achieving international competitiveness, and protecting the environment. The focus on energy security has led France to become one of the world's top producers and consumers of nuclear power.

Coal.—Charbonnages de France's last operating coal mine, La Houve Mine, which was located near Cretzwald, was closed by yearend 2004. This closure brought an end to coal mining in France (U.S. Energy Information Administration, 2006a§).

Natural Gas and Petroleum.—Because of France's limited natural gas resources (380 billion cubic meters), domestic production supplied only 5% of the natural gas that was consumed in the country. GdF, which was majority-owned by the Government, dominated natural gas activities. The EU has enacted directives that seek to liberalize European natural gas markets. France has been one of the slowest EU members to implement these directives into national law. In 2005, the Government sold shares in GdF to private investors to raise cash for the company; French law, however, required the Government to retain majority ownership of GdF (U.S. Energy Information Administration, 2006c§).

France had 159 million barrels of estimated proven reserves of petroleum at yearend 2005. Crude oil production was about 21,300 barrels per day in 2005. France was the 10th ranked consumer of petroleum in the world and consumed 1.91 million barrels per day (Mbbl/d) in 2005. To meet this demand, crude oil imports totaled 1.89 Mbbl/d in 2005. The major sources of these imports were Norway, Russia, Saudi Arabia, and the United Kingdom (U.S. Energy Information Administration, 2006c§).

Malta Oil Ltd. (MO) acquired from Eagle Energy Ltd. an 11.15% interest in an oil and gas exploration and exploitation license known as the St. Laurent Petroleum License in southwest France. MO's rights under the license would enable the company to receive revenues from the exploitation of oil and gas reserves in the license area. The St. Laurent Petroleum License covers an onshore area of about 650 square kilometers; it is located in the Acquitaine Basin, which was thought to contain some of Europe's largest onshore oilfields and gasfields (Petroleum Economist, 2006).

Nuclear Energy and Uranium.—Compagnie Générale des Matières Nucléaires, which was the state-owned uranium mining company, was the major producer of uranium. Its uranium mines remained closed in 2005.

France was the world's leading nuclear power generator on a per capita basis and ranked second in total installed nuclear

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capacity after the United States. About 79% of electricity generated in France came from 58 nuclear powerplants (U.S. Energy Information Administration, 2006b§).

The major nuclear enterprises were controlled by the state-owned holding company Areva S.A. The Government cancelled plans to sell a significant shareholding in Areva on the basis of the strategic importance of nuclear fuel and because the special requirements for handling enrichment and waste products warranted the maintenance of Government control. The Government owned about 87% of Areva, and an additional 9% was held by state-related entities. Private investors held about 4% (Mining Journal, 2005b).

Outlook

In part because it is one of the world's most developed economies, France is an advocate of the EU and European single-market concept. Reforms undertaken in France during the past two decades have helped the country's economic performance, but further improvements in regulations would benefit its businesses and citizens. France is the third ranked trading nation in western Europe after the United Kingdom and Germany and is expected to remain so. The country has had to make considerable changes in the structure of its industries, particularly those mineral industries controlled by the state. Some state-owned companies, such as EdF, have taken the initiative to become leaders in their respective industries. Others have been forced to make additional adjustments under rationalization schemes proposed by either the EU or the Government. These adjustments are expected to continue to bring the country more in line with EU policy. The depletion of mineral resources and/or the cessation of subsidies for uneconomic operations have affected local communities and their economies, and adjustments by the Government to compensate for these effects will be required. France has the advantage of plentiful electrical power to attract industrial facilities that require skilled workforces and good access to markets in Europe. The low cost of nuclear energy means that there is little economic justification to develop alternative fuel sources. If nuclear power is phased out, then imports of oil and gas will be required to supplement power production from wind farms.

References Cited

Industrial Minerals, 2005a, DAM acquired by Imerys: Industrial Minerals, no. 458, November, p. 3.

Industrial Minerals, 2005b, Talc de Luzenac celebrates 100 years: Industrial Minerals, no. 456, September, p. 12.

Metal Bulletin, 2005, Metaleurop S.A. wins fight for survivial: Metal Bulletin, no. 8915, October 17, p. 13.

Mining Journal, 2005a, Alcan smelter closure: Mining Journal, October 28, p. 7.

Mining Journal, 2005b, France halts Areva sale: Mining Journal, November 4, p. 16.

Petroleum Economist, 2006, News in brief—France: Petroleum Economist, v. 73, no. 2, February, p. 40.

Internet References Cited

International Monetary Fund, 2005 (September) France, World Economic Outlook Database, accessed October 13, 2005, at URL http://www.imf.org/external/pubs/ft/weo/2005/02/data/dbcoutm.cfm.

Lafarge Group, 2005 (December 15), Lafarge invests to keep pace with market growth, accessed September 26, 2006, at URL http://www.lafarge.com/cgi-bin/lafcom/jsp/news.do.

Salins Group, 2005, Salins, accessed June 8, 2005, at URL http://www.salins.com/en.html.

The Business Online, 2005 (August 14), Autumn sales looms for privatization in France, accessed September 15, 2006, at URL http://www.thebusinessonline.com/Stories.aspx.

The Economist, 2006 (June), Country briefs—France, accessed September 18, 2006, at URL http://www.economist.com/countries/France.cfm.

Umicore Group, 2005 (February 22), Press release—Umicore to refocus on zinc specialty products and cut commodity zinc production by 130,000 tonnes, accessed June 22, 2005, at URL http://www.investorrelations.umicore/en/pressreleases/2005/clio.E.pdf.

U.S. Central Intelligence Agency, 2006 (April), France, World Factbook 2006, accessed September 12, 2006, at URL https://www.cia.gov/cia/publications/factbook/geos/fr.html.

U.S. Energy Information Administration, 2006a (April), France, Country Analysis Brief—Coal, accessed September 12, 2006, at URL http://www.eia.doe.gov/emeu/cabs/France/Coal.html.

U.S. Energy Information Administration, 2006b (April), France, Country Analysis Brief—Electricity, accessed September 12, 2006, at URL http://www.eia.doe.gov/emeu/cabs/France/Electricity.html.

U.S. Energy Information Administration, 2006c (April), France, Country Analysis Brief—Natural Gas, accessed September 12, 2006, at URL http://www.eia.doe.gov/emeu/cabs/France/NaturalGas.html.

Major Sources of Information

Bureau de Recherches Géologiques et Minières (BRGM)
Avenue de Concyr, BP 6009
45060 Orléans, Cedex 2, France

Direction Général de l'Énergie et des Matières Premières (DGEMP)
61 Bld Vincent Auriol
75703 Paris, Cedex 13, France

Ministère de l'Économie, des Finances et de l'Industrie (MINEFI)
139, rue de Bercy
75572 Paris, Cedex 12, France

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TABLE 1
FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004[e]	2005[e]
METALS						
Aluminum:						
Bauxite, gross weight[3]	thousand metric tons	174	170	168	160 [r,4]	168 [4]
Alumina:						
Crude	do.	600	600 [e]	500 [e]	500	500
Calcined	do.	480	500 [e]	450 [e]	450	450
Metal:						
Primary	do.	462	463	445	451 [r,4]	442 [4]
Secondary	do.	253	262	240	236 [4]	222 [4]
Antimony, metal, including regulus[e]		500	500	500 [e]	500	500
Cadmium metal		176	63	--	--	--
Cobalt, metal:						
Powder[e]		600	500	500	500	500
Chloride		199	175	181	191 [4]	191 [4]
Copper, metal, secondary:[e]						
Blister		500	--	--	--	--
Refined		1,500	500	--	--	--
Gold, mine output, Au content	kilograms	2,510	1,724	1,470	1,312 [4]	--
Iron and steel:						
Metal:						
Pig iron	thousand metric tons	12,004	13,217 [r]	12,756	13,200 [4]	12,700 [4]
Ferroalloys, electric furnace:[e]						
Ferromanganese	do.	130	130	120 [r]	106	110
Ferrosilicon	do.	100	100	100	87	100
Silicomanganese	do.	50	50	107	64	65
Silicon metal	do.	75 [r]	75 [r]	75 [r]	75 [r]	75
Other	do.	65 [r]	65 [r]	65 [r]	65 [r]	65
Total	do.	420 [r]	420 [r]	467 [r]	397 [r]	415
Steel:						
Crude	do.	19,431	20,524	19,803	20,760 [4]	19,500 [4]
Hot-rolled	do.	16,593	18,561	18,400	19,128 [4]	18,000 [4]
Lead:						
Smelter, secondary		132,000 [e]	105,000	--	-- [4]	-- [4]
Refined:						
Primary		98,257	83,575	1,535	--	--
Secondary		143,338	111,643	96,155	105,600 [4]	105,500 [4]
Total		241,595	195,218	97,690	105,600 [4]	105,500 [4]
Magnesium metal, including secondary[e]		4,000 [5]	--	--	--	--
Nickel metal[6]		11,033	11,440	11,138	12,100	10,684 [4]
Silver:[e]						
Mine output, Ag content	kilograms	800	600	500	500	500
Metal, Ag content of final smelter products	do.	450	400	400	400	400
Tin, secondary		1,644	1,600	1,500	1,500	1,500
Tungsten, mine output, W content of powder[e]		500	500	500	500	500
Zinc metal, including slab and secondary		343,805	338,924	268,408	267,528 [4]	210,000
INDUSTRIAL MINERALS						
Barite, $BaSO_3$ equivalent		81,000	80,000 [e]	81,000	81,000	81,000
Bromine, elemental[e]		7,800	6,000	6,000	6,000	6,000
Cement, hydraulic	thousand metric tons	19,839	19,450 [r]	19,660 [r]	20,960 [4]	21,000
Clays:						
Kaolin and kaolinitic clay (marketable)	do.	375	339	323	316 [4]	316
Refractory clay, unspecified	do.	14	15 [e]	15 [e]	15	15
Diamond, synthetic, industrial[e]	thousand carats	3,600	3,600	3,600	3,600	3,600
Diatomite[e]	thousand metric tons	85	80	80	75	75

See footnotes at end of table.

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TABLE 1–Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004[e]	2005[e]
INDUSTRIAL MINERALS--Continued						
Feldspar, crude	thousand metric tons	650 [e]	659	671	628 [4]	625
Fluorspar:						
Crude	do.	250	250 [e]	250 [e]	260	250
Marketable:						
Acid- and ceramic-grade	do.	90 [r]	90 [r]	79	80	80
Metallurgical grade	do.	20	15 [r]	10	10	10
Total	do.	110 [r]	105	89	90	90
Gypsum and anhydrite, crude[e]	do.	4,500	4,500	3,500	3,500	3,500
Kyanite, andalusite, related materials[e]	do.	65	65	65	65	65
Lime, quick and hydrated, dead-burned dolomite[e]	do.	3,000	3,000	3,100	3,000	3,000
Mica[e]		10,000	10,000	10,000	10,000	10,000
Nitrogen, N content of ammonia	thousand metric tons	1,373	1,172	1,153	1,120 [4]	1,200
Pigments, mineral, natural, iron oxide[e]		1,000	1,000	1,000	1,000	1,000
Phosphates, Thomas slag	thousand metric tons	50	50 [e]	50 [e]	50	50
Potash, K_2O equivalent (marketable)	do.	257	139	-- [e]	--	--
Pozzolan and lapilli[e]	do.	400	400	400	400	400
Salt:						
Rock salt	do.	596	446	439	407 [4]	425
Brine salt, refined	do.	1,727	1,741	1,718	1,702 [4]	1,700
Marine salt[e]	do.	1,000	1,000	1,000	1,000	1,000
Salt in solution	do.	3,774	3,620	3,516	3,800	3,600
Total	do.	7,097	6,807	6,673	6,910	6,730
Sodium compounds:[e]						
Soda ash		1,000	1,000	1,000	1,000	1,000
Sodium sulfate		120	120	120	120	120
Stone, sand and gravel:[e]						
Limestone, agricultural and industrial		12,000	12,000	12,000	12,000	12,000
Slate, roof		30	30	30	30	30
Sand and gravel:						
Industrial sands		5,062	5,179	5,089	5,242 [4]	5,200
Other sand, gravel, and aggregates		172,764	166,788	160,884	163,404 [4]	165,000
Sulfur, byproduct:						
Of natural gas and petroleum		837 [r]	787 [r]	816 [r]	765	750
Of unspecified sources		260 [r]	229 [r]	196 [r]	200	200
Total		1,097 [r]	1,016 [r]	1,012 [r]	965	950
Talc:						
Crude		367,000	343,200	345,600	336,000 [4]	340,000
Powder[e]		300,000	300,000	300,000	300,000	300,000
MINERAL FUELS AND RELATED MATERIALS						
Asphaltic material[e]		25,000	20,000	20,000	20,000	20,000
Carbon black[e]		250,000	200,000	200,000	200,000	200,000
Coal, including briquets:						
Anthracite and bituminous	thousand metric tons	2,364	1,483	1,730	160 [4]	--
Lignite	do.	324	148	9	--	--
Total	do.	2,688	1,631	1,739	160 [4]	--
Briquets[e]	do.	200	175	175	100	100
Coke, metallurgical	do.	5,091	4,552	4,601	4,616 [4]	4,500
Gas, natural, marketed	million cubic meters	1,810 [e]	1,750	1,520	1,330 [4]	1,400
Petroleum:						
Crude	thousand 42-gallon barrels	10,082	9,825	9,150	8,550 [4]	7,775 [4]

See footnotes at end of table.

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TABLE 1–Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004[e]	2005[e]
MINERAL FUELS AND RELATED MATERIALS–Continued						
Petroleum–Continued:						
Refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	31,682 r	26,901 r	33,617 r	32,000 r,4	32,000
Gasoline, all kinds	do.	135,488 r	128,115 r	143,263 r	140,000 r,4	140,000
Kerosene and jet fuel	do.	47,815 r	41,428 r	41,356 r	42,000 r,4	42,000
Distillate fuel oil	do.	258,822 r	245,645 r	261,340 r	250,000 r,4	250,000
Residual fuel oil	do.	69,679 r	66,357 r	70,847 r	72,594 r,4	72,600
Other products[e]	do.	128,334 r	118,698 r	127,166 r	129,000 r,4	129,000
Refinery fuel	do.	37,084 r	34,128 r	34,419 r	35,000 r,4	35,000
Total	do.	708,904 r	661,272 r	712,008 r	700,594 r,4	701,000
Uranium:						
Mine output, U content		182	-- r	--	--	--
Chemical concentrate, U_3O_8 equivalent		156	12	--	--	--

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through September 2006.

[2]In addition to the commodities listed, France produces germanium from domestic ores, but actual output is not regularly reported. France also produced large amounts of stone, but statistics on output are not available.

[3]Reprocessed bauxite not for metallurgical use.

[4]Reported figure.

[5]Plant closed in June 2001.

[6]Excludes secondary production from nickel/cadmium batteries.

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TABLE 2
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		Aluminium Pechiney (Alcan Inc., 97.95%)	Plant at Gardanne	700
Aluminum		do.	Aluminum smelters at:	
Do.		do.	Saint-Jean-de-Maurienne, Savoie Province	120
Do.		do.	Nogueres, Pyrenees, Atlantiques Province	115
Do.		do.	Lannemezan, Hautes-Pyrenees Province	63
Do.		do.	Auzat, Arieege Province (closed)	50
Do.		Aluminium Dunkerque (Alcan Inc., 97.95%)	Dunkerque, Calais du Nord	250
Andalusite		Denain-Anzin Minéraux Réfractaire Céramique	Glomel Mine, Brittany	75
Antimony, metal		Produits Chimiques de Lucette	Plant at Le Genest, Mayeene Province	15
Barite		Barytine de Chaillac	Mine and plant at Chaillac, Indre Province	150
Do.		Société Industrielle du Centre	Mine at Rossigno, Indre Province	100
Cadmium	metric tons	Compagnie Royale Asturienne des Mines	Plant at D'Auby-les-Douai, Nord Province	200
Cement		Eight companies, the largest of which are:	80 plants, including:	23,233
Do.		LaFarge S.A.	15 plants; largest at St. Pierre-la-Cour (1,160)	7,815
Do.		Société des Ciment Français	13 plants; largest at Gargenville (1,100)	6,190
Clay, kaolin		La Source Compagnie Minière	Kaolin d'Arvor Mine, Quessoy	300
Coal		Charbonnages de France (CdF), including:		
Do.		Centre-Midi Bassin	Open pit mines (closed)	1,000
Do.		Lorraine Bassin	Underground mines (closed)	2,500
Cobalt, metal	metric tons	Société Métallurgique le Nickel (SLN)	Plant at Sandouville, near Le Havre	600
Copper, metal		Compagnie Générale d'Électrolyse du Palais	Electrolytic plant at Palais-sur-Vienne	45
Do.		Société Française d'Affinage du Cuivre	Smelter at Poissy, Yvelines	11
Diatomite		Ceca S.A.	Mines and plants at Riom-les-Montagnne and St. Bauzille	100
Feldspar		Denain-Anzin Mineraux S.A. (Imerys Group)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys		Comilog International	Plant at Boulogne-sur-Mer	500
Do.		Société du Ferromanganese de Paris, Outreau	Plant at Boulogne-sur-Mer	420
Do.		Pechiney Electrométallurgie	Plants at Bellegarde, Laudun, and Marignac	400
Fluorspar		Société Génerale de Recherches et d'Exploitation Minières (Alcan Inc.)	Mines in southern France	150
Gold	kilograms	Mines d'Or de Salsigne (Eltin Co., 51%; Ranger Co., 18%; Peter Hambro Plc., 10%)	Salsigne Mine near Carcassonne (closed)	3,000
Gypsum		S.A. de Matériel de Construction	Mine at Taverny	1,500
Iron and steel, steel		Sollac Atlantique S.A. (Acelor Group)	Dunkerque	6,700
Do.		do.	Fos-sur-Mer	4,200
Do.		do.	Florange	3,200
Do.		Sollac Unimetal (Usinor Group, 100%)	Gadrange, Neuves Maisons, and Thonville	8,400
Lead, metal		Metaleurop Nord (Metaleurop S.A.)	Plant at Noyelles Godault (closed)	165
Magnesium, metal		Pechiney Electrométallurgie	Plant at Marignac (closed)	15
Mica		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters	Société Nationale Elf Aquitaine (SNEA)	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgia le Nickel (SLN)	Plant at Sandouville	16
Nitrogen, N content of ammonia		Grande Paroisse S.A.	Plant at Grandpuits	390
Petroleum:				
Crude	42-gallon barrels per day	Société National Elf Aquitaine (SNEA)	Paris Basin oilfields	1,000
Refined	do.	Total S.A.	Refineries at Gonfreville and La Mede	446,000
Do.	do.	Shell-Française	Refinery at Petite Couron	285,000
Do.	do.	do.	Refinery at Berre	270,000
Do.	do.	Société Nationale Elf Aquitaine (SNEA)	Refinery at Feyzin	120,000
Do.	do.	do.	Refinery at Donges	200,000
Do.	do.	do.	Refinery at Grandpuits	96,000
Do.	do.	Société Française British Petroleum (S.F.B.P.)	Refineries at Lavera	175,000
Do.	do.	Esso S.A.	Refineries at Fos-sur-Mer	237,000
Do.	do.	Mobil Oil Française	Refineries at Gravenchon	62,000
Do.	do.	Cie. Rhenane de Raffinage (CRR)	Refinery at Reichstett	80,000

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TABLE 2--Continued
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Potash, K_2O		Mines de Potasse d'Alsace S.A. (MDPA)	Amelie and Marie-Louise Mines in Alsace (closed)	2,500
Salt		Compagnie des Salins du Midi et des Salines de l'Est (Salins Group)	Mines and plants at Algues Mortes, Dax, Salin de Girad, and Varangeville	2,500
Sulfur		Société Nationale Elf Aquitaine (SNEA)	Byproduct from natural gas, Lacq plant	3,000
Talc		Talc de Luzenac S.A. (Rio Tinto Corp., 100%)	Trimouns Mine near Ariege, Pyrenees	350
Uranium, U_3O_8	metric tons	Compagnie Général des Matières Nucléaires (Areva S.A.)	Mines at Limousin, Vendee, and Herault (closed)	1,800
Zinc, metal		Umicore Group	Plants at Auby-les-Douai and Calais	220
Do.		Metaleurop Nord (Metaleurop S.A.)	Plant at Noyelles Godault (closed)	110

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THE MINERAL INDUSTRY OF GERMANY

By Steven T. Anderson

In 2005, Germany remained a leading global exporter of industrial goods and services (including processed and fabricated mineral products). However, the country's mineral industry depended almost entirely on imported mineral raw materials. Germany did produce almost enough lignite to satisfy domestic consumption. The international competitiveness of the country's nonfuel mineral processing and fabrication sectors relied primarily on such factors as a highly skilled labor force, rapid assimilation of new technology (especially metal and other mineral materials recycling technologies), and the development and maintenance of liberal trade relationships both within and outside of the European Union (EU), which officially expanded to 25 members in May 2004. Through 2004 and 2005, rising global demand for fossil fuels and associated price increases for imports of mineral fuels into Germany have had a significant effect on the operating costs for the country's mineral industry. During this same timeframe, rapid development of mineral processing operations in economically less developed or lower cost (for mineral extraction, processing, and transportation) regions of the world placed increased pressure on the mineral industry to minimize energy, labor, and material costs within the country (U.S. Library of Congress, Federal Research Division, 2005, p. 10; Bundesverband der Deutschen Industrie e.V., 2006c).

In 2005, Germany's gross domestic product (GDP) based on purchasing power parity was about $2,522 billion, which was 3.33% higher than that of 2004. The real GDP (adjusted only for inflation) increased by just 0.9% compared with that of 2004, and the rate of inflation was about 2%. In 2004 (the latest year for which reliable trade data were available), Germany spent 3% of its nominal GDP (or about $76 billion) on imports of mineral raw materials, including crude petroleum ($31 billion), natural gas ($18 billion), nonferrous metals ($9.4 billion), ferroalloys ($4 billion), ferrous metals ($3.7 billion), all types of coal ($3.6 billion), precious metals and stones ($3.2 billion), industrial minerals ($1.5 billion), and other mineral fuels, including uranium ($1.4 billion).[1] In 2005, the nominal value of Germany's production of basic ferrous and nonferrous metals (not including production of finished metal products, such as castings from German foundries) increased to about $86.74 billion from $76.95 billion in 2004 mainly because of higher metal prices (Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, p. 24, 29-30; Statistisches Bundesamt, 2006, p. 15; International Monetary Fund, 2006§[2]).

In current dollars, the value of the country's mine output of industrial minerals was about $4.4 billion and contributed about 0.16% of Germany's GDP compared with $4.2 billion and about 0.15% of the GDP in 2004. Mine production of bituminous and anthracite (hard) coal was economical compared with importing these types of coal to meet domestic demand but only because producers received Government subsidies. Because of these subsidies, it is not possible to accurately interpret publicly available figures concerning the total value of production of these types of coal and its contribution to the GDP. Domestic production of lignite was not subsidized. In 2005, the nominal value of the country's mine production of lignite was about $195 billion and contributed about 7.11% of Germany's nominal GDP, which was a slight decrease compared with $199 billion and about 7.25% of the GDP in 2004. In terms of tonnage, Germany was the world's leading producer of lignite. The country was also the fourth ranked producer of potash in the world and the leading producer in the EU. Germany led the EU and was the world's second ranked producer of salt (NaCl content). Germany was ranked only slightly below the Czech Republic in production of kaolin in the 25-member EU and was the fourth ranked producer in the world. Germany was also a leading producer of barite, bentonite, crude gypsum, and feldspar in the EU. Germany's metal processing sector was the leading producer of aluminum metal, refined copper, and crude steel in the EU and the EU's second leading producer of refined lead and zinc metal (Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, p. 138, 150, 155, 157, 159, 161, 165; Kostick, 2006; Statistik der Kohlenwirtschaft e.V., 2006; Statistisches Bundesamt, 2006, p. 12; Virta, 2006; International Monetary Fund, 2006§).

In 2005, Germany's economy continued a trend begun in 1993 of increased expenditures on imports of mineral raw materials. Previously, the expenditure for net imports of nonprecious metals (mostly ores and concentrates) had decreased to 0.09% of Germany's real GDP by 1993 from about 0.5% in 1970 partially owing to more-efficient use of these materials in manufacturing and to evolution of the overall economy toward relatively greater added value from the services sector. In 2004 (the latest year for which reliable data were available), the cost of importing nonprecious metals (including rapidly increasing amounts of scrap metal) had increased to about 0.62% of the real GDP, which placed Germany among the upper one-third of industrialized countries that imported nonprecious metals and the country was estimated to have maintained that rank in 2005. For comparison, China spent about 1.5% of its real GDP on imports of nonprecious metals in 2004, and France spent -0.003%; Sweden, -0.012%; the United States, -0.026%; Canada, -0.158%; and India -0.217% (Bundesverband der Deutschen Industrie e.V., 2006a, d).

In 2004 (the latest year for which reliable statistics were available), the percent contribution of all industrial production to gross value added in the German economy was 25.1% compared with 30.6% in 1991. This value added by industrial production was led by, in decreasing order of percent contribution, the automobile industry, machinery production, production of chemicals (including those derived from domestically mined industrial minerals), and production of iron and steel products and nonferrous metals. From 1991 to 2005, the industrial sector

[1]Where necessary, values have been converted from euros (€) to U.S. dollars (US$) at an annual average exchange rate of €0.80431=US$1.00 for 2004 and €0.80273=US$1.00 for 2005.

[2]References that include a section mark (§) are found in the Internet References Cited section.

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was losing its relative share in domestic gross value added to the services sector at a much lower rate than from 1970 to 1991, and industry's share appeared to be leveling off at about 25% in 2005. For at least the next 15 to 20 years, the value added by industrial production was expected to continue to retain its relative importance within the German domestic economy at above a 20% share. The gross domestic value added by the metals processing sector was an estimated $60 billion through the foundry stage (amount does not include further stages in production of finished metal products, the services associated with selling metal products, or any processing and production of precious metals in Germany) (Bundesverband der Deutschen Industrie e.V., 2006c, d; Statistisches Bundesamt, 2006, p. 15; International Monetary Fund, 2006§).

Government Policies and Programs

In 2005, the Government continued to implement its "Agenda 2010," which was a series of policy objectives aimed at increasing international competitiveness and employment and decreasing expenditures on healthcare and welfare by both the Government and private firms, including those companies involved in the mineral industry. Germany's Agenda 2010 was being implemented alongside a set of reforms known as the Lisbon Strategy that was approved in 2000 by the European Commission to increase the competitiveness in global markets of all members of the EU. The series of changes in Germany's labor market associated with Agenda 2010 are known as Hartz I, II, III, and IV, after Peter Hartz (the head of the German commission that was set up in 2002 to draft these reforms). Hartz IV came into effect at the beginning of 2005. In 2005, the unemployment rate in Germany was 9.1%, which represented a slight decrease compared with an unemployment rate of 9.2% in 2004. Real wages in the country continued to fall after already falling in 2003 and 2004. In 2005, domestic employment levels increased only slightly, if at all, for most industries. Some companies increased investment in mineral-related development projects in foreign countries with lower labor costs and reduced their domestic production capacity. An incentive to invest abroad for firms in the processing sector (not just the extractive sector) of the mineral industry was the high cost of transporting ores and concentrates to Germany for further processing, which was at a record level in 2005. Traditionally, investment abroad by German mineral industrial companies had been more focused on investing only in mineral extraction in foreign countries to help secure those deposits of mineral raw materials for further processing and some end consumption in Germany (Berger and Danninger, 2006; Bundesverband der Deutschen Industrie e.V., 2006c; International Monetary Fund, 2006§).

Industrial representatives advocated that, because private companies—including those heavily involved in the mineral industry—had consolidated and restructured to cut costs extensively by the end of 2005, the Government should continue to follow through on its proposed Agenda 2010 reforms. These industrial leaders suggested that the Government still needed to make further reductions in the corporate tax in order to lower it to an internationally competitive level. They also lobbied for policymakers to not follow through on plans to implement an increase of 3% (to 19% from 16%) in the value-added tax rate, to implement a proposed trade tax, or to increase taxes to supplement the national healthcare system in 2007. In 2005, the Government and industrial leaders did agree on some reforms, which included increasing the eligibility age for social security to 67 and increasing grants for industrial research and development. Industrial representatives continued to lobby for reducing such nonwage labor compensation as company financing of the social security system, company contributions to unemployment insurance, and company funding of the national healthcare system. These representatives basically continued to adopt the position that it was still too expensive to employ more workers in Germany. Companies also lobbied for more flexibility in hiring and firing, including reducing the trial period that firms must wait before dismissing a new employee to substantially below the Government's proposed period of 24 months (U.S. Library of Congress, Federal Research Division, 2005, p. 9-11; Berger and Danninger, 2006; Bundesverband der Deutschen Industrie e.V., 2006b).

In March 2005, the EU revised its Lisbon Strategy, including eliminating the target date for required completion of reforms (2010). The revised strategy set general guidelines for 3-year nation-specific economic reform programs to be more fully developed by each EU member state. By the end of 2005, the German Government was still debating implementation of the planned Agenda 2010 reforms of nonwage worker compensation by firms, and the Hartz IV reforms had not yet achieved the designed goals of reducing social welfare costs or the number of persons unemployed after the first full year of implementation. The Government was also considering proposals for a revised economic reform program to replace Agenda 2010, in compliance with the revised Lisbon Strategy (Sykes, 2005).

In 2005, some of the 10 newest members of the EU [the EU (10) countries], which were officially admitted on May 1, 2004, had already implemented extensive reforms to improve the efficiency and international competitiveness of their economies, including reforms of mineral industries that had been predominantly state-run before these market reforms were enacted. Even after implementation of Hartz IV, the mineral industry of Germany still had more-generous unemployment and other social benefits than were in effect in such new EU countries as the Czech Republic and Poland. In 2005, the mineral industries in some of the EU (10) countries were taking advantage of lower labor costs and a surprisingly attractive climate for investment, including foreign direct investment (FDI) by companies based in the 15 older EU countries [EU (15), including Germany], to create stronger competition within the EU (15) member countries for EU imports of raw mineral materials and exports of refined mineral products (U.S. Library of Congress, Federal Research Division, 2005, p. 2, 10, 14; Bundesverband der Deutschen Industrie e.V., 2006b, c, d; Norddeutsche Affinerie AG, 2006, p. 2-3).

In 2005, the Government was considering removing or reducing labor quotas that Germany and some other EU (15) countries had hitherto kept in place to restrict imports of labor from the EU (10) countries until 2011 (in Germany). Such a policy change could reduce incentives for companies to

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transfer operations to or develop new mineral producing or processing projects in the EU (10) countries by speeding up equalization of labor costs for companies among the EU (15) and EU (10) countries. The German Government expressed a preference for EU (10) countries to raise wages and taxes more quickly, however, given the difficulty of lowering these costs in Germany. On December 29, the German finance minister called for the EU (10) countries to reform their tax systems to promote fair fiscal competition and to reduce the flow of EU (15) investment and relocations of German firms into EU (10) countries (Bundesverband der Deutschen Industrie e.V., 2006b; EUbusiness Ltd., 2005§).

Trade policy was another important policy issue for the mineral industry of Germany. In 2005, industrial representatives in Germany continued to be concerned about securing primary mineral raw materials (ores and concentrates) for the country's metals processing sector and other industries, and they lobbied specifically for better EU trade protection rules against exports of scrap metal. They suggested that Germany possesses some of the most efficient and environmentally friendly technology in the world to extract metals from scrap materials, but that the current EU trade guidelines were resulting in increased outflows of scrap metals from Germany and other EU countries as the international markets for these metals continued to experience shortages during the year. These industrial advocates cited Russia as an example of a nearby competitor for scrap metals that was utilizing a 15% tariff on exports of scrap steel and a 50% tariff on exports of scrap aluminum and copper to retain more of that country's scrap for recycling of these strategically important metals. Well before scrap metals became such a scarce commodity and China accounted for such a significant proportion of global demand for scrap, many EU-based metallurgical companies had replaced open hearth operations with mainly scrap-fed electric arc furnaces (Bundesverband der Deutschen Industrie e.V., 2006a, c, d; Norddeutsche Affinerie AG, 2006, p. 2-3).

Structure of the Mineral Industry

In 2005, small- to medium-scale producers (SMEs) still represented the most common scale of production within the mineral industry of Germany, although more in the mining, quarrying, and processing of industrial minerals than in the processing of metals. The German term for describing most of the companies in the mineral industry is "Mittelstand," which is commonly used to describe a firm of 100 to 1,000 employees. Many metal processing companies have become quite large with increased consolidation of ownership in the EU and Germany, although some of these companies were still considered part of the Mittelstand either because of the historic workforce levels or because they were producers of intermediate goods, regardless of the scale of production or the number of employees. In 2005, mineral industry firms still labeled as part of the Mittelstand included companies with 5 to 5,000 employees, although the Institut für Mittelstandsforschung Bonn (in cooperation with the EU) was attempting to redefine Mittelstand firms to be only those that hire fewer than 500 employees and are almost entirely family owned (Hartmann, 2005).

The major companies involved in the mineral industry of Germany that employ more than 1,000 people are the coal producers RAG Aktiengesellschaft (hard coal) and RWE Power AG (lignite). About 35,000 of RAG Aktiengesellschaft's 98,000 employees were employed by the company's coal mining subsidiary, Deutsche Steinkohle AG, and 18,923 of these were employed "subsurface" (RAG Aktiengesellschaft, 2006, p. 1, 22). In 2005, RWE Power was the subsidiary of RWE Aktiengesellschaft, which was still in charge of lignite production, and 5,572 of RWE Power's approximately 18,700 employees contributed to mine production of lignite on a full-time basis (RWE Power AG, 2006).

Most of the metal processing companies, especially the steel producers, employed substantial numbers. In 2005, the major steel producers were ThyssenKrupp Steel AG (28,400 employees in production of crude steel within Germany), Salzgitter AG (17,600 employees), and Arcelor S.A. (about 6,000, which included only employees at EKO Stahl GmbH and Stahlwerke Bremen GmbH). The nonferrous metal processing companies that were large employers in Germany were Hydro Aluminium Deutschland GmbH (5,600 in Germany) and Norddeutsche Affinerie AG (2,424). Xstrata plc was a prominent example of a metal processor in Germany that ranked solidly in the Mittelstand, because about 300 people were employed by its zinc smelter in Nordenham, Germany. The company that employed the most people to produce industrial minerals in Germany was HeidelbergCement AG (4,400). On average from 2001 through 2005, the metal processing sector employed roughly 800,000 people per year within Germany, and the industrial minerals sector employed about 150,000 people per year (HeidelbergCement AG, 2006, p. 49; Norddeutsche Affinerie AG, 2006, p. 71; Norsk Hydro ASA, 2006, p. 86; Salzgitter AG, 2006, p. 5; Sigge, 2006; ThyssenKrupp Steel AG, 2006, p. 96; Arcelor Eisenhüttenstadt GmbH, 2006§).

Almost all sectors of the mineral industry of the EU have undergone increased concentration in ownership, and this trend continued in 2005. In the steel sector, consolidation of ownership took a big step in 2006 with the acquisition of Arcelor (based in Luxembourg) by Mittal Steel Co. NV of the Netherlands. In Germany, Arcelor completely owned EKO Stahl, Stahlwerke Bremen, and Stahlwerk Thüringen GmbH in addition to a majority interest (51.25%) in AG der Dillinger Hüttenwerke. Mittal had already acquired a steel plant in Hamburg through acquisition of Hamburger Stahlwerke GmbH in 1995 and two steel plants near Duisburg through acquisition of Thyssen Duisburg GmbH in 1997. Arcelor was formed in 2002 by the merger of ARBED S.A. (Luxembourg), Aceralia Corporación Siderúrgica (Spain), and USINOR S.A. (France). ARBED contributed its ownership of Stahlwerke Bremen (acquired in 1995) and Stahlwerk Thüringen (acquired in 1992) to Arcelor's properties in Germany, and USINOR contributed its ownership of EKO Stahl (acquired in 1998) and its interest in Dillinger Hüttenwerke (acquired in 1989) (Businessworld, 2005; AG der Dillinger Hüttenwerke, 2005§; Arcelor S.A., 2006§; Arcelor Thüringen GmbH, undated§).

The merger of Thyssen Stahl AG and Krupp Stahl AG in 1999 to form ThyssenKrupp Stahl AG (the name was changed to ThyssenKrupp Steel AG in 2005) provided the leading

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German-based counterweight to foreign ownership of crude steel production capacity. In 2005, the second ranked producer was Salzgitter AG whose indirect interests in Hüttenwerke Krupp Mannesmann GmbH (HKM) enabled it to outrank Arcelor during the year. Salzgitter owned about 7.9 million metric tons per year (Mt/yr) of crude steel production capacity in Germany. Arcelor, which ranked a close third with about 7.7 Mt/yr of capacity, was expected to move up in the rankings in 2006 because of its merger with Mittal. In June 2005, Salzgitter formed a joint venture with Vallourec S.A. of France. This resulted in Salzgitter's 45% share of Vallourec & Mannesmann Tubes S.A. (VMT) being transferred to Vallourec, which in turn reduced its share in HKM to 20% compared with 30% in 2004. Also as part of this deal, Salzgitter increased its direct share in HKM to 30% from 20% through Salzgitter's wholly owned subsidiary, Mannesmannröhren-Werke GmbH (for which it had just finished acquiring the last 7% interest from ThyssenKrupp in December 2004). By the end of 2005, Salzgitter's share of Vallourec (and VMT) was 17.2% (table 2; Salzgitter AG, 2006, p. 6, 10-11, 12, 14, 19; ThyssenKrupp Steel AG, 2006, p. 9, 13; Thyssen AG, 1998, p. 27).

In 2005, Norsk Hydro ASA of Oslo, Norway, owned the largest share of combined primary and secondary aluminum production capacity in Germany, but production still remained competitive because of lower entry costs for potential producers of secondary metal. Primary production in Germany required additional investment in negotiating contracts with foreign alumina and bauxite mineral providers and paying transportation costs to import the necessary raw mineral materials from a much greater distance than that required to transport scrap to the country's secondary smelters, on average. Along with domestic energy costs, international transportation costs were at record levels during the year. Norsk Hydro also targeted replacement of primary production capacity with secondary at its wholly owned subsidiary Hydro Aluminium Deutschland GmbH mainly because secondary production of aluminum metal was estimated to require about 95% less energy. Since completing its acquisition of Hüttenwerke Kayser AG in 2003, Norddeutsche Affinerie controlled production of almost all the secondary refined copper in Germany and was essentially the only producer of primary refined cathodes in the country (Norddeutsche Affinerie AG, 2006, p. 12, 56-58; Norsk Hydro ASA, 2006, p. 5, 33, 35, 39, 55).

Consolidation in ownership of the production capacities for producing industrial minerals also continued to increase in 2005. In January, Buzzi Unicem SpA (Italy) increased its share of the total share capital of Dyckerhoff AG to about 76.7% compared with 64.9% in 2004. Buzzi Unicem began its acquisition of Dyckerhoff in August 2003 and was the second ranked producer of cement in Germany in 2005. This was partly owing to Dyckerhoff's acquisition of Deuna Zement GmbH in 1991. HeidelbergCement AG was the leading cement producer in Germany after the company completed its acquisition of Anneliese Zementwerke AG in March 2003 by purchasing the remaining 48.8% interest held by Dyckerhoff. WBB Minerals Limited of the United Kingdom acquired Fuchs'sche Tongruben GmbH & Co. KG in 1974 and was the leading producer of kaolin in Germany until it was acquired by S.C.R.-Sibelco NV of Belgium through Sibelco's merger with Watts Blake Bearne & Co. of the United Kingdom in 2001. Kali und Salz GmbH has been the only producer of potash in Germany since acquiring Mitteldeutsche Kali Aktiengesellschaft in 1993, and of rock salt since merging the company's salt business with that of Solvay S.A. (Belgium), including the Solvay subsidiary esco GmbH, in 2004. At the beginning of 2005, K+S Salz GmbH was separated from Kali und Salz as a separate company focused on the increased rock salt business, and Kali und Salz was renamed K+S Kali GmbH to reflect its focus on potash ("Kali") production (WBB Minerals Limited, 2005; Dyckerhoff AG, 2006, p. 44-45; HeidelbergCement AG, 2006, p. 48, 82, 141; King, 2006; K+S Aktiengesellschaft, 2006§).

In 2005, Sibelco was the world's leading producer of silica sand and ball clay with more than 225 plants on 5 continents. Increased concentration of ownership of mineral commodity production capacity globally could continue to contribute to the ongoing increase in the ownership concentrations in the industrial minerals and metals sectors of the mineral industry of Germany. Mergers and acquisitions in the metals processing sector appear to take place in waves of increased activity followed by lulls of very little activity. The surge in consolidation activity that was ongoing in 2005 appears to have resulted from an increased emphasis on privatization of industry in the EU and less restrictions on FDI, especially after the Lisbon Strategy was adopted in 2000. In 2006, consolidation in the metals processing sector of the mineral industry of the EU was still continuing even following EU approval of the merger of Arcelor and Mittal, and it was not clear when the pace of consolidation would subside to negligible levels again. A similar level of consolidation in ownership of mining and quarrying capacities for production of industrial minerals in Germany and the EU appears to have already taken place substantially earlier than in the metals sector. This was at least partially because the ownership rights to extract industrial minerals from existing sites were under less control by EU-member Governments, on average, although acquiring new lands and opening new areas for the extraction of industrial minerals has recently become more difficult owing to increased levels of environmental protection in EU land-management legislation (Sykes, 2005; WBB Minerals Limited, 2005; MEPS International Ltd., 2006a, b; Okes-Voysey and Forbes, 2006, p. 1).

Environmental Issues

EU environmental directives require that the member nations reach certain environmental objectives by a set date, and that the provisions of the directives have to be included as part of the national laws of all members. These EU directives usually outline general rules but seldom set out any detailed requirements and do not regulate how the directive is to be implemented. Directives are the most frequently used policy instruments in EU environmental policy. In 2005, the EU environmental directives that were of particular concern to companies involved in the mineral industry of Germany were the Greenhouse Gas Emission Trading Scheme (EU-ETS Directive), Mining Waste Directive, and Groundwater Directive. Based on a 2004 study, steel industry officials claimed that

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the uneven implementation of the EU-ETS by individual EU member states had placed steel companies operating in Germany at a disadvantage in 2005 compared with those operating in almost every other EU member country, including steel companies in Austria, Finland, Luxembourg, the Netherlands, and the United Kingdom. This was because the emissions trading scheme allowed companies with high emissions in other countries to acquire a greater number of EU permits to continue lower-cost (higher-emissions) production, while companies based in Germany still had to install required scrubbers to lower emissions as part of Germany's own domestic emissions reduction program and could not use the permits. The evaluation in the study determined that the costs associated with acquiring and renewing these permits would add less to other EU-country-based companies' operating costs than the costs to companies based in Germany of using and maintaining the cleaner technologies (Steel Institute VDEh and German Steel Federation, 2004; Sykes, 2005; European Communities, 2006§).

Mineral and metals companies were also required to comply with the EU's Pollutant Release and Transfer Register (EU-PRTR) in order for the EU to track the emission, transportation, and disposal of potential pollutants. During autumn 2005, the EU parliament began formal debate on the EU's new chemical control directive—Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Although other EU safety and environmental regulations already cover such mine products as minerals, ores, and concentrates, the REACH proposal was designed to more directly require mineral producers to prove that these substances should not be classified as hazardous materials by testing and registering all contents of these chemically complex substances rather than leave this task to EU regulators. REACH could allow classification of many industrial minerals and metals (including metals contained in scrap) as hazardous chemicals until proven otherwise by the producers. For mine production of metals, representatives of mineral industries in Africa and South America were attempting to defend the producers in those countries against the additional costs that REACH would impose on mineral companies that export to Germany and other EU states. German steel producers were also lobbying for steel scrap to no longer be declared as waste, according to the European Waste Directive, or defined as a hazardous material, according to REACH (Mining Journal, 2004; Sykes, 2005; Wall Street Journal, The, 2005; Association of German Steel Recycling and Disposal Companies and German Steel Federation, 2006; Azzopardi, 2006§).

Production

In 2005, most mineral producing and processing companies in Germany were able to demonstrate higher productivity, in accordance with the provisions of the Lisbon Strategy and Agenda 2010, but these claims were based on reduced costs through restructuring coupled with high prices for most of the mineral commodity output of these firms. Levels of production of processed metals mostly remained the same or decreased in 2005 compared with those of 2004. The few exceptions were recovery of refined copper from secondary sources, primary production of lead metal, secondary production of magnesium metal, recovery of platinum-group metals (PGM) (mostly as a byproduct of copper refining, including from secondary sources), and recovery of a bit more uranium from the ongoing cleanup of the former Wismut Mine (table 1; Kidd, 2005). Decreased production of metals was not primarily caused by constraints on production capacity, however, although limiting excess capacity was a goal in the restructuring efforts of many metal processing companies during this timeframe in Germany. The largest constraints on production were the high costs of energy and mineral raw material inputs, most of which were imported (Okes-Voysey and Forbes, 2006, p. 4, 10, 16-18).

In 2005, demand for industrial minerals by the chemical industry of Germany, which was mostly export-oriented, helped encourage increased production of a few industrial minerals compared with 2004, such as boron compounds, fluorspar, synthetic soda ash, and marketable sulfur. Demand for industrial minerals by the domestic agricultural and construction sectors remained mostly stagnant, however, and production of cement, lime, nitrogen, phosphoric acid, and dimension stone decreased. In Germany and the EU, production of natural industrial minerals was becoming increasingly constrained by limited land access to mineral resources. Advocates of the industrial minerals sector claimed that operations that extracted these minerals in 2005 occupied about 0.02% of the total land area regulated by the EU, while agriculture occupied more than 30%. An estimated 20% of the EU's surface area was environmentally protected to a level that prohibited raw mineral extraction, and German officials claimed that the European Commission considered minerals to be of low importance, relative to the environment, in land-use planning for the EU (table 1; Sykes, 2005).

Trade

In 2005, a leading concern of the metal processing sector was the amount of scrap that was leaving the country. In 2004, Germany exported about 9.2 million metric tons (Mt) of iron and steel scrap, 614,000 metric tons (t) of scrap aluminum, 408,000 t of refined copper scrap, and significant quantities of most other marketable scrap metals. For aluminum, copper, and ferrous metals, scrap was the leading export of each metal, respectively. Scrap exports of aluminum and ferrous metals were shipped mostly to other EU countries, but Germany's most important customer for copper scrap metal was China. The rest of Germany's trade in metals reflected its primary role in the global mineral industry as an importer of metallic ores and concentrates and an exporter and consumer of processed metal. Germany did export small amounts of some metallic ores and concentrates as an important transshipping hub. Even refined metal commodities were mostly not exported but further used in German industrial production of automobiles, machinery, and other finished products, of which the metal content is not contained in the tables of this chapter. The United States was generally not a significant consumer (importing at least 5%) of Germany's metal exports, but was the top ranked importer of arsenic; bismuth; cobalt contained in scrap; ferrochromium; iridium, osmium, and ruthenium; mercury; PGM (waste); palladium; rhodium; and zirconium. U.S. imports of nickel contained in scrap, tungsten contained in scrap, and zinc powder

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ranked it as second among Germany's export markets for these metals. The United States was also the third ranked importer of German exports of refined copper and platinum metal (tables 3, 4; Bundesverband der Deutschen Industrie e.V., 2006c).

In 2004, the mineral industry of Germany was an important primary producer of industrial minerals and supplier for the EU, although a considerable amount of the country's exports in this sector were also part of its extensive role as a transshipper. As a primary producer, Germany was an important supplier of cement, kaolin, feldspar, peat, salt, silica sand, and sulfur, almost entirely to other EU countries. The United States was a top ranked importer only of mullite from Germany; otherwise the U.S. market was not a leading destination for industrial minerals from Germany. Mullite is an important product of ceramic clay producers in the Westerwald region of Germany, however. As Germany continues gradually to reduce the Government's subsidy on mine production of hard coal, the country has become more dependent on imports. The steel manufacturing sector has become especially dependent on imports of hard coking coal as domestic supplies continue to decrease. Before Poland officially joined the EU in 2004, Germany's most important sources of hard coal and coke were all outside of the EU, including, in order of quantity imported, Australia, Canada, China, South Africa, and Russia. Germany is basically self-sufficient in lignite but substantially import dependent on all other mineral fuels. The only mineral fuel for which the United States is a significant importer from Germany is enriched uranium (tables 3, 4; Taylor, 2005; Bundesverband der Deutschen Industrie e.V., 2006c; King, 2006).

Commodity Review

Metals

Aluminum.—At the end of 2005, Norsk Hydro closed the smelter and carbon capacity of the Hamburger Aluminium-Werke GmbH (HAW) in agreement with the two other joint owners of HAW. Hydro also announced that it planned to close its Elbewerk primary aluminum plant at Stade at the end of 2006. These closures and announcements of further closures were reportedly in response to the inability of the company to secure energy contracts for these plants at rates that would sustain profitable production for a sufficient period into the future. The company expressed optimism that these two closures would improve the international competitiveness of its primary aluminum production operations (Norsk Hydro ASA, 2006, p. 35, 54).

Copper.—In 2005, Norddeutsche Affinerie AG (NA) still had the largest capacity for producing refined copper in the EU, even after restructuring in 2003 and the first quarter of 2004. This restructuring resulted in a relative decrease in primary production, such that only 60% of its copper cathode production was produced from inputs of imported ores and concentrates and 40% was from recycled materials (which were much more available and less costly domestically). Although NA still did not venture into owning a majority interest in any foreign copper mines, the company secured two new contracts in July 2005 to process concentrates from the Ok Tedi Mine in Papua New Guinea and the Batu Hijau Mine in Indonesia. The company expected these contracts to result in increased production of primary refined copper in 2006 and a more-efficient utilization of existing production capacity. The production of primary refined PGM increased substantially in 2004 compared with that of 2003 and increased significantly again in 2005. These increases in production are related to the PGM content of copper ores and concentrates processed by NA (unpublished). Total German imports of copper ores and concentrates increased to 1,142 t in 2004 compared with 880 t in 2003 and were expected to increase again (slightly) to about 1,150 t in 2005 (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, p. 86; Mining Journal, 2005; Norddeutsche Affinerie AG, 2006, p. 12, 63).

Iron and Steel.—In 2005, Germany accounted for about one-fourth of total crude steel production in the EU (25), and was ranked sixth in world production. ThyssenKrupp Steel was the 10th ranked producer in the world (Bundesministerium für Wirtschaft and Technologie, 2006§). ThyssenKrupp continued to restructure to reduce its crude steel production costs in response to decreasing availability and increasing costs of importing the necessary mineral raw materials in Germany. During the year, ThyssenKrupp's cost-cutting efforts included cutting back production of crude steel by 100,000 Mt in the second quarter and by another 200,000 Mt in the third quarter from levels planned at the beginning of the year. The cuts were primarily owing to an unexpected buildup in company inventories during the first quarter (AFX News Limited, 2005).

The company agreed to invest in an expansion of its crude steel production capacity, but in Sepetiba, Brazil, rather than in Germany. In Brazil, costs were considerably lower and the availability of mineral raw materials, especially iron ore, was substantially higher. Companhia Vale do Rio Doce of Brazil had a 10% interest in the new Brazilian steel mill, and ThyssenKrupp expected the mill to have a production capacity of 4.4 Mt/yr of crude steel and be completed by about the middle of 2008. The company expected eventually to expand its production capacity of coated steel and rolled products in Germany after securing this additional, lower-cost supply of crude steel from this project in Brazil, although no timeline for this capacity expansion in Germany was provided in 2005. In addition to vertically integrating downward into securing energy sources for metals processing by owning controlling shares in mineral fuel production facilities, which was taking place in the aluminum and copper refining sectors in Germany, ThyssenKrupp also had secured the exclusive services of at least one existing hard coal mine in Germany that had provided energy and coking coal for the steel company since 2003 (Statistik der Kohlenwirtschaft e.V., 2004; ThyssenKrupp Steel AG, 2006, p. 11, 37, 48-49).

Zinc.—Since purchasing the zinc smelter and refinery in Duisburg in 2003, Sudamin MHD GmbH invested in restructuring the operation to convert it into a more-modern processing facility that could produce high-quality zinc and other minor metals from 100% recycled sources of feed (itelligence AG, 2004). This modernization process was scheduled to be completed in 2005, but the restructuring was reportedly not sufficient to keep pace with increasing energy

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costs in Germany. Instead, the company officially closed the smelter on August 8, 2005 (Thurtell, 2005; BaseMetals.com, 2005§).

Industrial Minerals

Cement.—HeidelburgCement AG was the leading producer of cement in Germany and the fourth ranked producer in the world. In 2005, the company's operations in Germany still exhibited a lower use of capacity than company leaders wanted. These leaders also expressed dissatisfaction with high costs (especially for energy) and high taxes in Germany. The company did increase domestic production by 7% to 7.6 Mt in 2005 compared with 7.1 Mt in 2004 after acquiring Teutonia Zementwerk AG, Hannover, in December 2004. In 2005, the company continued restructuring its operations in Germany to increase capacity utilization and reduce costs. The company estimated that its domestic production from the same plants that it operated in 2004 (excluding Teutonia Zementwerk) decreased by about 2% in 2005. New methods to reduce costs included substituting blast furnace slag (recycled from steel production) and fly ash (recovered from coal driven power stations) for clinker in some of the company's domestic cement production. These recycled inputs were less costly than the natural raw mineral inputs that are traditionally used in the production of clinker. Other cement companies also substituted these inputs in their cement production in Germany. Of the total cement produced in Germany in 2005, about 3 Mt (9.8%) was produced using fly ash and 2.5 Mt (8.2%) was produced using blast furnace slag (HeidelburgCement AG, 2006, p. 2, 22, 28, 36, 42-43, 48; ICR Research, 2006).

Clay and Shale.—In 2005, not much restructuring was going on in the clays sector of the mineral industry of Germany because most ownership consolidation and reorganization had already taken place long before. The leading producer was WBB Fuchs GmbH & Co. KG (a subsidiary of WBB Minerals and a specialist in kaolinitic clays), but some other significant German companies were still family-owned SMEs, such as Goerg & Schneider GmbH & Co. and Stephan Schmidt KG. Germany was one of the leading producers of kaolin in Western Europe. All these producers were able to remain internationally competitive by producing relatively valuable customized blends, which was still cost effective because up to 25 different clays could be extracted from any one pit operated by these companies, which were located predominantly in the Westerwald region. WBB Fuchs specialized in high alumina blue clays, light firing refractory clay, and kaolins for refractories. The company produced about 200 different blends of clays, many for specific ceramic applications, such as isostatic pressing and pressure casting. Stephan Schmidt produced white- and light-firing clays, red-firing clays with high mechanical strength, special clays for engobes and glazes, binding clays, granulated clays, and spray-dried clay bodies. Georg & Schneider specialized in refractory clays, especially chamotte (or firebrick clay) and ball clays (or plastic clays). All these clay blends contained kaolins, but WBB Fuchs produced the highest grade kaolin, on average, with about 38% Al_2O_3 content (Taylor, 2005; King, 2006).

Mineral Fuels

Relative to its consumption, Germany has relatively insignificant domestic mineral fuel sources, other than coal, and must rely on imports to meet its energy needs. As a result of energy-saving measures, energy efficiency (the amount of energy required to produce a unit of gross domestic product) has been improving since the beginning of the 1970s. Oil was expected to remain the primary energy source, but Germany planned to reduce import reliance and reliance on nuclear energy by increasing the energy consumption share of renewable sources (mostly wind-generated energy and some biomass projects) to 20% by 2020 from 7% in 2005. The Government's policy to accomplish this goal centered around "feed-in tariffs," which are included in prices paid by electricity distribution companies to companies that generate electricity from renewable sources. The "tariff" portion of the premium price paid by distributors for renewable power is then subsidized by the Government. In 2004, the share of Germany's primary energy consumption that was provided by oil was about 36% followed by natural gas (23%), hard coal (14%), nuclear power (13%), and lignite (11%); the remainder was provided by nonmineral-fuel energy sources. In 2000, the Government agreed to phase out all nuclear powerplants by 2022 and this policy resulted in the closure of the Obrigheim plant on May 11, 2005 (U.S. Energy Information Administration, 2005, U.S. Library of Congress, Federal Research Division, 2005, p. 11-12; Energy Research Centre of the Netherlands, 2005§). In 2005, industrial leaders in Germany asserted that there is an essential compatibility between Germany's obligation to protect the environment and a strategy to maintain diversity in the country's energy supply, including nuclear fuel (Bundesverband der Deutschen Industrie e.V., 2005).

Coal.—Hard coal mining is centered in the Ibbenbüren, the Ruhr, and the Saar coalfields in Germany and is uneconomical without subsidies because the current resources lie prohibitively far underground (SPG Media Limited, 2005§). As the hard coal subsidy is phased out, more mines are being closed resulting in greater imports of hard coal, coking coal, and coke. The Lohberg-Osterfeld Mine was scheduled to be closed, which resulted in only eight active hard coal mines being left operational. The Walsum and the Lippe Mines were also scheduled to be closed in 2009 and 2010, respectively (Bundesministerium für Wirtschaft und Arbeit, 2005, p. 66). In the second quarter of 2005, however, the price of imports of hard coal was 22% higher than that of the second quarter of 2004. In 2004, 99% of the coal imported into Germany was hard coal, and the country imported even more hard coal in 2005. If the price of imports continues to rise, then production of hard coal could potentially become economically viable again without a subsidy. The amount of the subsidy was about $3.36 billion in 2005, which was about $130 per metric ton of combined anthracite and bituminous coal produced during the year. Companies in the mineral industry of Germany did not expect this to be the case before the Walsum and Lippe Mines are closed, however. RAG's energy subsidiary, STEAG AG, planned to build a new coal-fired powerplant at Walsum, which is located close to the Rhine River, because the river

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offers efficient access to imports of hard coal. Norddeutsche Affinerie also was interested in entering the electricity supply sector in Germany by building a hard coal-fired powerplant in the Hamburg area that would be accessible to imports of hard coal through the harbor there (Frondel and others, 2006; RWE Aktiengesellschaft, 2006, p. 97-98; Rzeznitzeck, 2006).

Outlook

In 2005, a reconsideration of industrial competitiveness policies in the EU and Germany was underway, the outcome of which could greatly affect how the mineral industry of Germany will evolve. Costs for labor, energy, and mineral raw materials continued to increase in the country and even surpassed those in many fellow members of the EU, especially the new EU (10) countries. The response of companies has been to restructure internally to reduce these costs and to invest in developing new capacity abroad rather than domestically. Additionally, vertical integration and concentration of ownership has increased, even across sectors of the mineral industry. In the metal processing sector, it can be expected that more of the metals companies that have so far been mostly left out of the recent wave of mergers and acquisitions will be attempting to find additional partners in 2006 and 2007 (Bundesverband der Deutschen Industrie e.V., 2006c).

Even as the scarcity of domestic minerals in Germany is increasing, the Government's hard coal subsidy and the EU's land-use policy is being debated. Together with all of the other high costs in Germany, the higher cost of imports of hard coal, coking coal, and coke for steel manufacturing encouraged steel manufacturers to lobby for keeping existing mines open in the country. Representatives of the industrial minerals sector also lobbied the EU for increased access to environmentally protected lands and areas currently occupied by subsidized agricultural interests. Some metal processing companies established new long-term contracts with producers of natural mineral materials (mines and quarries) outside of the EU, to secure a flow of the necessary mineral raw materials. This traditional approach for companies in Germany continued to become more costly in 2005, however, primarily because transportation costs continued to attain record levels. The primary concern for maintaining an economically important mineral industry in Germany will be to reduce the cost burdens on the companies, including energy, labor, and taxes, in order to encourage investment in continuing mineral production and at least maintaining processing capacity domestically.

References Cited

AFX News Limited, 2005, ThyssenKrupp cuts Q3 steel output by 200,000 tonnes, will not hike prices in Q3: London, United Kingdom, AFX News Limited, June 8, 1 p.

Association of German Steel Recycling and Disposal Companies and German Steel Federation, 2006, Scrap steel should no longer be declared as waste: Düsseldorf, Germany, Association of German Steel Recycling and Disposal Companies and German Steel Federation joint statement and press release, September 5, 1 p.

Berger, H., and Danninger, S., 2006, Germany—Is too much regulation preventing faster growth?: Washington, DC, International Monetary Fund, IMF survey, v. 35, no. 2, January 23, p. 28-29.

Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, Rohstoffsituation 2004: Hannover, Germany, Bundesanstalt für Geowissenschaften und Rohstoffe, October, 203 p.

Bundesministerium für Wirtschaft und Arbeit, 2005, Annual economic report for 2005: Berlin, Germany, Bundesministerium für Wirtschaft und Arbeit, March 22, 100 p.

Bundesverband der Deutschen Industrie e.V., 2005, Trade and competitiveness—Old issues repackaged?: Berlin, Germany, BDI International Policy Brief, Issue 1/05, Bundesverband der Deutschen Industrie e.V., 2 p.

Bundesverband der Deutschen Industrie e.V., 2006a, BDI—Potenziale bei Secundär- und nachwachsenden Rohstoffen besser nutzen—Standard für Recycling europaweit harmonisieren: Berlin, Germany, BDI Pressemitteilung, Bundesverband der Deutschen Industrie e.V., September 14, 2 p.

Bundesverband der Deutschen Industrie e.V., 2006b, Broad-based upturn: Berlin, Germany, Bundesverband der Deutschen Industrie e.V., BDI Economic Report, Issue 2/06, April 24, 5 p.

Bundesverband der Deutschen Industrie e.V., 2006c, Export champion and Bazaar economy—How Germany is coping with globalization: Berlin, Germany, Bundesverband der Deutschen Industrie e.V., BDI Foreign Economic Report, September, 4 p.

Bundesverband der Deutschen Industrie e.V., 2006d, German exports grow strongly: Berlin, Germany, Bundesverband der Deutschen Industrie e.V., BDI Foreign Economic Report, Issue 2/06, April 24, 10 p.

Businessworld, 2005, Recasting global steel: Kolkata, India, ABP Pvt. Ltd., August 15, p. 30-38.

Dyckerhoff AG, 2006, Annual report 2005: Wiesbaden, Germany, Dyckerhoff AG, March 3, 155 p.

Frondel, M., Kambeck, R., and Schmidt, C.M., 2006, Hard coal subsidies—A never-ending story?: Essen, Germany, Rheinisch-Westfälisches Institut für Wirtschaftsforschung, RWI discussion papers, no. 53, November, 19 p.

Hartmann, Karsten, 2005, German Mittelstand deals—Dead, or alive and kicking?: London, United Kingdom, Acquisitions Monthly, Thomson Financial Limited, September, p. 2-3.

HeidelbergCement AG, 2006, Annual report 2005: Heidelberg, Germany, HeidelbergCement AG, March 22, 164 p.

ICR Research, 2006, Take a deep breath: Surrey, United Kingdom, International Cement Review, Tradeship Publications Ltd., June, p. 20-26.

itelligence AG, 2004, Sudamin MHD GmbH chooses itelligence as SAP consultancy: Bielefeld, Germany, itelligence AG press release, August 17, 1 p.

Kidd, Stephen, 2005, Uranium prices still to make impact: London, United Kingdom, Mining Communications Ltd, July 1, p. 18-22.

King, Laura, 2006, Ball clays dig deep: Industrial Minerals, no. 464, Industrial Minerals Information, Metal Bulletin plc., May, p. 30-39.

Kostick, D.S., 2006, Salt, *in* Metals and minerals: U.S. Geological Survey Minerals Yearbook 2004, v. I, p. 63.1-63.24.

MEPS International Ltd., 2006a, After Arcelor/Mittal more consolidation is inevitable: Sheffield, United Kingdom, International Steel Review (monthly), MEPS (International) Ltd., June, 10 p.

MEPS International Ltd., 2006b, Hostile Mittal bid for Arcelor may hinder future steel consolidation: Sheffield, United Kingdom, International Steel Review (monthly), MEPS (International) Ltd., July, 10 p.

Mining Journal, 2004, Controversial EU directive closes in: London, United Kingdom, Mining Communications Ltd., October 8, p. 3.

Mining Journal, 2005, NA settles term TC/RCS: London, United Kingdom, Mining Communications Ltd., July 1, p. 3.

Norddeutsche Affinerie AG, 2006, Annual report 2004/05: Duisburg, Germany, Norddeutsche Affinerie AG, January 31, 120 p.

Norsk Hydro ASA, 2006, Annual report and Form 20-F 2005: Oslo, Norway, Norsk Hydro ASA, March 7, 105 p.

Okes-Voysey, Mark, and Forbes, Jim, 2006, Forging ahead—Mergers and acquisitions activity in the global metals industry, 2005: New York, New York, PricewaterhouseCoopers International Limited, May 24, 22 p.

RAG Aktiengesellschaft, 2006, 2005 annual report: Essen, Germany, RAG Aktiengesellschaft, May, 115 p.

RWE Aktiengesellschaft, 2006, Facts & figures 2006: Essen, Germany, RWE Aktiengesellschaft, October, 291 p.

RWE Power AG, 2006, RWE Power in the Rhenish lignite mining area: Essen-Cologne, Germany, RWE Aktiengesellschaft, 2 p.

Rzeznitzeck, Peter, 2006, STEAG AG reports record results, sales and profit boosted once again—New power plant projects planned: Essen, Germany, STEAG Aktiengesellschaft, press release, May 24, 3 p.

Salzgitter AG, 2006, Annual report 2005: Salzgitter, Germany, Salzgitter AG, March 30, 234 p.

Digitized by Google

Sigge, Petra, 2006, Neue perspective für 300 stahlwerker: Bremen, Germany, Weser Kurier, Bremer Tageszeitungen AG, January 12, p. 17.
Statistik der Kohlenwirtschaft e.V., 2004, Zur lage des kohlenbergbaus in der Bundesrepublik Deutschland, Jahr 2003: Essen-Cologne, Germany, Statistik der Kohlenwirtschaft e.V., March, 14 p.
Statistik der Kohlenwirtschaft e.V., 2006, Zur lage des kohlenbergbaus in der Bundesrepublik Deutschland, Jahr 2005: Essen-Cologne, Germany, Statistik der Kohlenwirtschaft e.V., March, 14 p.
Statistisches Bundesamt, 2006, Fachserie 4, reihe 3.1—Produzierendes gewerbe, produktion im produzierenden gewerbe—Jahr 2005: Wiesbaden, Germany, Statistisches Bundesamt, November 5, 322 p.
Steel Institute VDEh and German Steel Federation, 2004, New report shows that emissions trading will harm the steel industry in Germany internationally: Düsseldorf, Germany, Medieninformation, Steel Institute VDEh and German Steel Federation, May 19, 1 p.
Sykes, Christophe, 2005, Minerals key to a competitive Europe: Industrial Minerals, no. 453, Industrial Minerals Information, Metal Bulletin plc., May, p. 82-85.
Taylor, Lindsey, 2005, Clays on fire: Industrial Minerals, no. 459, Industrial Minerals Information, Metal Bulletin plc., November, p. 30-35.
Thurtell, David, 2005, CBA Commodities—The base party rages on: Sydney, Australia, Commonwealth Bank of Australia, October 28, 14 p.
Thyssen AG, 1998, The Thyssen Krupp merger: Düsseldorf, Germany, Thyssen AG, October, 34 p.
ThyssenKrupp Steel AG, 2006, Annual report 2004-2005: Duisburg, Germany, ThyssenKrupp Steel AG, February 24, 99 p.
U.S. Energy Information Administration, 2005, Country analysis brief—Germany: Washington DC, U.S. Energy Information Administration, November, 14 p.
U.S. Library of Congress, Federal Research Division, 2005, Country profile—Germany: Washington DC, U.S. Library of Congress, December, 25 p.
Virta, R.L., 2006, Clay and shale, *in* Metals and minerals: U.S. Geological Survey Minerals Yearbook 2004, v. I, p. 18.1-18.37.
Wall Street Journal, The, 2005, Europe—EU chemicals bill worries Africa's miners: The Wall Street Journal, October 31, p. A14.
WBB Minerals Limited, 2005, Plastic clays and kaolins—Summary of technical data: Sandbach, United Kingdom, WBB Minerals Limited, 12 p.
World Cement, 2004, HeidelbergCement vs. German laws—Germany, world cement business: World Cement, v. 35, no. 9, September, p. 6.

Internet References Cited

AG der Dillinger Hüttenwerke, 2005, The most important partnerships of Dillinger Hütte, accessed October 16, 2006, at URL http://www.dillinger.de/dh/unternehmen/struktur/index.shtml.en.
Arcelor Eisenhüttenstadt GmbH, 2006, Zahlen & Fakten, accessed October 16, 2006, at URL http://www.arcelor-eisenhuettenstadt.com/content/pages/company_facts.php?lang=de.
Arcelor S.A., 2006, History, accessed October 16, 2006, at URL http://www.arcelor.com/index.php?lang=en&page=77.
Arcelor Thüringen GmbH, [undated], ARCELOR THÜRINGEN Unterwellenborn, accessed October 16, 2006, via URL http://www.arcelor-thueringen.de/euntern.html.
Azzopardi, Tom, 2006 (October 6), Copper, other concs not subject to EU chemicals law—Argentina, Metals Place, accessed October 11, 2006, at URL http://metalsplace.com/metalsnews/?a=7552.
BaseMetals.com, 2005 (June 5), Bullish sentiment seems to be waning in the metals, accessed June 8, 2005, at URL http://www.basemetals.com/content/reports/bm/william/basemetalsreport-W06052005.htm.
Bundesministerium für Wirtschaft und Technologie, 2006, Stahl und Metall, accessed October 4, 2006, at URL http://www.bmwi.de/BMWi/Navigation/root,did=31320.html.
Energy Research Centre of the Netherlands, 2005 (October 18), Germany Fact Sheet—Feed-in tariffs, accessed October 20, 2005, at URL http://www.renewable-energy-policy.info/relec/germany/policy/feed-in.html.
EUbusiness Ltd., 2005 (December 29), German finance minister calls for Eastern Europe to raise taxes, accessed October 26, 2006, at URL http://www.eubusiness.com/archive/Finance/051229113232.mhl00zmq.
European Communities, 2006 (June), Overviews of the European Union activities—Environment, accessed October 26, 2006, at URL http://europa.eu/pol/env/overview_en.htm.
International Monetary Fund, 2006 (September), Germany, World economic outlook database, accessed October 7, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/index.htm.
K+S Aktiengesellschaft, 2006, Historie, accessed October 18, 2006, at URL http://www.k-plus-s.com/de/about/historie.html.
SPG Media Limited, 2005, Ruhr, Saar and Ibbenbüren hard coal mining, Germany, accessed October 3, 2005, at URL http://www.mining-technology.com/project_printable.asp?ProjectID=1256.

Major Sources of Information

Bundesanstalt für Geowissenschaften und Rohstoffe [Federal Institute for Geosciences and Natural Resources]
Stilleweg 2, Postfach 51 01 53 30631
Hannover, Germany

Bundesministerium für Wirtschaft und Technologie [Federal Ministry for Economics and Technology]
Scharnhorststr. 34-37
D-10115 Berlin, Germany
Telephone: 49 (0) 30-2014-9
FAX: 49 (0) 30-2014-7010

Statistisches Bundesamt, Deutschland [Federal Statistics Office, Germany]
Gustav-Stresemann-Ring 11 65180
Wiesbaden, Germany

Major Publications

Bundesanstalt für Geowissenschaften und Rohstoffe: Rohstoffsituation, 2004, Hannover, Germany.

Bundesministerium für Wirtschaft und Technologie: Der Bergbau und der Bundesrepublik Deutschland, Bergwirtschaft und Statistik—56. Jahrgang 2005, Berlin, Germany.

Mineralölwirtschaftsverband e.V.: Jahresbericht, Mineralöl-Zahlen, 2005, Hamburg, Germany.

Statistik der Kohlenwirtschaft e.V.: Zur Lage des Kohlenbergbaus in der Bundesrepublik Deutschland, 2003-2005, Essen-Cologne, Germany.

Statistisches Bundesamt: Fachserie 4, Reihe 3.1—Produzierendes Gewerbe, Produktion im Produzierenden Gewerbe—Jahr 2003-2005, Wiesbaden, Germany.

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TABLE 1
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Alumina, Al_2O_3 equivalent[e]	thousand metric tons	715	717 r	830	835	830
Metal:						
Primary		651,592	652,845	660,793	667,839	647,934
Secondary		622,907	666,148	680,385	703,756	703,545
Total		1,274,499	1,318,993	1,341,178	1,371,595	1,351,479
Arsenic, white, Ar_2O_3 content[e]		100 r	100 r	-- r	-- r, 2	-- 2
Cadmium, metal, refinery including secondary		539	422	640 r	640 r, e	640 e
Cobalt, metal, including cobalt oxide[e]		-- r	-- r	-- r	-- r	--
Copper, metal:						
Smelter:						
Primary		317,700	295,100	288,800	278,600	257,200
Secondary		240,900	283,100	306,600	262,600	251,400
Total		558,600	578,200	595,400	541,200	508,600
Refined:						
Primary		303,000	327,000	286,653	283,686	239,982
Secondary		390,773	368,791	310,925	368,956	398,778
Total		693,773	695,791	597,578	652,642	638,760
Iron and steel:						
Ore, run of mine[3]:						
Gross weight	thousand metric tons	407	419	429	412	360
Fe content	do.	57	59	60	58	38
Metal:						
Pig iron	do.	29,184	29,427	29,461	30,018	28,854
Direct reduced iron	do.	210	540	590	610	400 e
Ferroalloys:						
Ferrochromium		19,308	20,018	18,318	24,857	22,672
Other[e, 4]		35,000	30,000	32,000	26,000	25,000
Steel, crude	thousand metric tons	44,803	45,015	44,809	46,374 r	44,524
Semimanufactures	do.	37,011	37,763	37,174	39,976	37,771
Lead, metal, refined:						
Primary		155,862	141,202	132,155	115,869	118,778
Secondary[e, 5]		217,500 r	238,700 r	224,700 r	243,304 2	222,932 2
Total		373,400 r	379,902	356,900 r	359,173	341,710
Magnesium, metal including castings		25,945	24,506	25,987	26,591	28,160
Platinum-group metals, metal, refined	kilograms	60,439 r	35,561 r	51,847 r	95,135 r	104,725
Selenium, metal[e]	do.	15,000	16,000	14,000	14,000	12,000
Silicon, metal[e]		27,739 2	25,257 2	27,500	27,500	27,500
Silver, metal, refined, secondary		523 r	520 r	592 r	568 r	546
Tin, alloys		14,420	11,447	6,143	5,431	4,912
Zinc, metal:						
Primary		269,200	272,900	255,200	252,133	245,140
Secondary[e, 5]		89,140	105,700	132,900	129,887 2	89,751 2
Total		358,341	378,561	388,131	382,020	334,891
INDUSTRIAL MINERALS						
Abrasives:						
Natural, pumice		123,755 r	43,354 r	--	-- e	-- e
Artificial, corundum		56,939 r	56,728	59,097	72,565	73,620
Barite, marketable (contained $BaSO_4$)		108,111	100,993	109,506	93,624	88,591
Boron compounds, manufactured, including boric acid and oxide		127,670 r	168,250 r	176,837 r	168,841 r	203,475
Bromine compounds, manufactured, including oxide		231 r	413 r	388 r	248 r	274
Cement:						
Clinker, intended for market	thousand metric tons	25,227	23,954	25,233	26,281	24,315
Hydraulic	do.	32,118	31,009	32,749	31,854 r	30,629

See footnotes at end of table.

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TABLE 1--Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Chalk, natural, including ground	thousand metric tons	1,045	1,022	1,001	1,005	1,068
Clays, natural:						
Bentonite	do.	448	495	479	405	405
Ceramic and refractory clays	do.	5,500	4,700	4,300	4,400	4,500
Of which, fire clay and chamotte	do.	159	167	167	176	176
Fuller's earth[e]	do.	-- [r]	-- [r]	-- [r]	-- [r]	--
Kaolin, marketable	do.	3,764	3,666	3,487	3,752	3,768
Other, unspecified	do.	341 [r]	281 [r]	191 [r]	197 [r]	185
Diatomite	do.	50	54 [r]	55 [r]	54 [e]	54 [e]
Feldspar[e, 6]		302,650 [r, 2]	243,368 [r, 2]	400,000 [r]	500,000	500,000
Fluorspar:						
Acid-grade		30,381 [r]	34,429 [r]	33,289 [r]	33,203 [r]	35,400
Metallurgical-grade[e]		-- [r]	-- [r]	-- [r]	-- [r, 2]	-- [2]
Total		30,381 [r]	34,429 [r]	33,289 [r]	33,203 [r]	35,400
Graphite, natural		3,190	3,312	2,840	3,155	2,638
Gypsum and anhydrite, natural	thousand metric tons	1,966 [r]	1,761	1,748	1,579	1,644
Lime, quicklime, dead-burned dolomite	do.	6,920 [r]	7,139 [r]	6,876 [r]	6,947 [r]	6,810 [e]
Magnesium salts, byproduct of potash mining	do.	1,233	1,411	1,288	1,197 [r]	1,200 [e]
Nitrogen, N content of ammonia	do.	2,522	2,560 [r]	2,803	2,741 [r]	2,289
Peat, natural		115,470	122,696	135,356	119,961	120,000 [e]
Phosphate materials:						
Phosphatic fertilizers, P_2O_5 content[e]		-- [r]	-- [r]	-- [r]	-- [r]	--
Phosphoric acid, manufactured, P_2O_5 content		35,340	34,486	32,569	37,810	37,374
Thomas slag:[e]						
Gross weight	thousand metric tons	-- [r]	-- [r]	-- [r]	-- [r]	--
P_2O_5 content		-- [r]	-- [r]	-- [r]	-- [r]	--
Pigments, iron oxide[e]		4,000 [r]	4,000 [r]	4,000 [r]	4,000 [r]	4,000
Potash, K_2O content:						
Crude	thousand metric tons	4,337	4,278	4,413	4,439	4,434
Marketable	do.	3,549	3,472	3,563 [r]	3,627 [r]	3,664
Salt, NaCl content, marketable:						
Evaporated salt, including marine salt	do.	827	858	727	572	594
Industrial brines	do.	7,629	8,307	9,078	10,432	9,904
Rocksalt and other brines	do.	5,887	6,468	6,501 [r]	7,701 [r]	8,679
Total	do.	14,343 [r]	15,633 [r]	16,306 [r]	18,705 [r]	19,177
Siliceous earth, marketable		50,361	53,711	54,517	54,801	50,000 [e]
Sodium compounds, n.e.s.:						
Soda ash (Na_2CO_3), manufactured	thousand metric tons	1,500 [e]	1,512 [r]	1,493 [r]	1,438 [r]	1,533
Sulfate, manufactured[e]	do.	-- [r]	-- [r]	-- [r]	-- [r]	--
Stone, sand and gravel:						
Stone, crude:						
Dimension, including partially worked	do.	315	237	167	229	212
Of which, dolomite and limestone	do.	69	76	106	76	75
Crushed, not including chalk	do.	172,585 [r]	166,798	160,851	153,040	153,000 [e]
Dolomite and limestone, not for cement manufacture	do.	34,410	31,300	30,000	23,700	20,600
Gravel, natural:						
Building gravel	do.	77,406 [r]	73,131 [r]	70,173 [r]	65,566 [r]	65,700 [e]
Crude, including flint and pebbles	do.	16,697 [r]	14,505 [r]	13,632 [r]	12,889 [r]	12,900 [e]
Other gravel, including quarzite	do.	11,600	11,877	13,295	10,898	10,900 [e]
Sand, natural:						
Building sand	do.	70,912 [r]	65,414 [r]	67,603 [r]	63,785 [r]	63,800 [e]
Silica sand, including glass sand and quartz sand	do.	7,835	7,839	7,953	8,162	8,200 [e]
Other, including from granite and pegmatite	do.	11,603	11,617	13,115	13,239	13,300 [e]
Total sand and gravel	do.	196,053 [r]	184,383 [r]	185,771 [r]	174,539 [r]	175,000 [e]

See footnotes at end of table.

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TABLE 1--Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Sulfur:						
Marketable	thousand metric tons	988	1,093	1,014	939	1,055
Byproduct:						
Metallurgy[e]	do.	684	754	701	591	600 [e]
Natural gas and petroleum	do.	1,749	1,745	1,661	1,503 [r]	1,585
Total	do.	2,433	2,499	2,362	2,094 [r]	2,190 [e]
Talc and steatite, natural[e]		-- [r]	-- [r]	-- [r]	-- [r]	-- [r]
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bitumen, natural		9,910	8,011	1,680	-- [r]	--
Coal:						
Anthracite and bituminous, marketable	thousand metric tons	27,054	26,088	25,684	26,496 [r]	25,698
Lignite	do.	175,365	181,778	179,085	181,926	177,907
Coke:						
Of anthracite and bituminous coal	do.	7,289	7,226	7,827	8,200 [e]	8,100 [e]
Of lignite	do.	173 [e]	154 [e]	165	187	173
Fuel briquets:						
Of anthracite and bituminous coal	do.	140 [e]	124	114	102	92
Of lignite including dust and dried	do.	1,740	1,365	1,466	1,435	1,490
Gas:						
Manufactured:						
Blast furnace	thousand cubic meters	8,749	8,781	8,936	9,100 [e]	8,800 [e]
Coke oven	do.	3,362	3,310	2,870	3,000 [e]	2,900 [e]
Total	do.	12,111	12,091	11,806	12,100 [e]	11,700 [e]
Natural:						
Gross	do.	21,545	21,422	22,092 [r]	20,405	19,903
Marketable	do.	20,200 [r,e]	20,116 [r]	20,190 [r]	19,333 [r]	18,900 [e]
Petroleum:[e,7]						
Crude	thousand 42-gallon barrels	26,200 [r]	27,600 [r]	27,900 [r]	25,800 [r]	26,200
Refinery products:						
Liquefied petroleum gas	do.	38,000 [r]	37,000 [r]	38,000 [r]	37,000 [r]	37,000
Distillate fuel oil	do.	350,000 [r]	350,000 [r]	360,000 [r]	370,000 [r]	390,000
Residual fuel oil	do.	70,000 [r]	65,000 [r]	69,000 [r]	77,000 [r]	74,000
Gasoline, including aviation	do.	210,000 [r]	210,000 [r]	210,000 [r]	210,000 [r]	210,000
Kerosene and jet fuel	do.	32,000 [r]	32,000 [r]	32,000 [r]	34,000 [r]	33,000
Naphtha	do.	82,000 [r]	82,000 [r]	86,000 [r]	94,000 [r]	94,000
Refinery gas	do.	45,100 [r]	48,700 [r]	51,600 [r]	51,300 [r]	50,600
Bitumen, bituminous mixtures, and other residues	do.	32,000 [r]	32,000 [r]	30,000 [r]	29,000 [r]	32,000
Lubricants and miscellaneous oils	do.	11,000 [r]	11,000 [r]	11,000 [r]	15,000 [r]	14,000
Petroleum coke	do.	9,700 [r]	9,400 [r]	10,000 [r]	10,000 [r]	11,000
Mineral jelly, waxes, and paraffins	do.	1,600 [r]	1,500 [r]	1,500 [r]	1,800 [r]	1,800
Other	do.	13,000 [r]	12,000 [r]	8,400 [r]	11,000 [r]	9,400
Total	do.	890,000 [r]	890,000 [r]	910,000 [r]	940,000 [r]	960,000
Uranium concentrate, U content		27 [r]	221 [r]	104	77	80

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. [r]Revised. -- Zero.

[1]Table includes data available through November 2006.

[2]Reported figure.

[3]Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to use in the steel industry.

[4]Estimated from reported domestic sales of ferroalloys [Statistische Bundesamt, 2006, Fachserie 4, Reihe 3.1—Produzierendes Gewerbe, Produktion im Produzierenden Gewerbe, Jahr 2005: Wiesbaden, Germany, Statistische Bundesamt, August, p. 178].

[5]Estimated by subtraction of primary from total, and rounded to four significant digits.

[6]After 2002, figures estimated from reported figures that include production of feldspar bearing rocks, but excluding the estimated production of aggregates from these rocks where the feldspar was not extracted and the feldspar content was not measured.

[7]All figures were converted to barrels from those reported in metric tons according to data from Mineralölwirtschaftsverband e.V., 2006, Jahresbericht—Mineralöl-Zahlen, 2005: Hamburg, Germany, Mineralölwirtschaftsverband e.V., May, p. 79, and reflect significant digits of conversion factors (three digits for crude petroleum and two digits for refinery products).

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TABLE 2
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[2]	Location of main facilities	Annual capacity
Alumina		Nabaltec GmbH	Plant at Schwandorf (special aluminas)	55
Do.		Aluminium Oxid Stade GmbH (DADCO Alumina & Chemicals Ltd., 100%)	Plant at Stade	900
Do.		Martinswerk GmbH (Albemarle Corporation, 100%)	Plant at Bergheim (fused alumina)	350
Aluminum		Hydro Aluminium Deutschland GmbH (Norsk Hydro ASA, 100%)	Primary smelters: Elbewerk at Stade and Rheinwerk at Neuss; Primary rolling mill at Grevenbroich	300
Do.		Aluminium Norf GmbH (Alcan Inc., 50%, and Norsk Hydro ASA, 50%)	Lippenwerk at Lünen (secondary) and primary rolling mill at Neuss	600
Do.		Metallhüttenwerke Bruch GmbH	Secondary foundry alloy plant at Dortmund; secondary cast alloy plants at Asperg and Bad Säckingen	110
Do.		VAW-IMCO Guss und Recycling GmbH (Aleris International, Inc., 100%)	Secondary smelters: Erftwerk at Grevenbroich and Innwerk at Töging	320
Do.		Trimet Aluminium AG	Smelter at Essen-Borbeck	155 e
Do.		Hamburger Aluminium-Werke GmbH (Norsk Hydro ASA, Alcoa Inc., and Austria Metall AG, 33.33% each)	Primary smelter at Hamburg	130
Do.		Corus Aluminium Voerde GmbH	Primary smelter at Voerde and rolling mill at Koblenz	100
Arsenic, metal	metric tons	PPM Pure Metals GmbH (Metaleurop S.A., 100%)	Plant at Langelsheim	5
Barite		Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach	60
Do.		Deutsche Baryt-Industrie Dr. Rudolf Alberti GmbH & Co. KG	Wolkenhügel Mine in the Harz Mountains and plant at Bad Lauterberg	50
Bentonite		Süd-Chemie AG	Plants at Moosburg, Duisburg, and Heufeld	500
Do.		Kärlicher Ton- und Schamotte-Werke Mannheim & Co. KG (KTS)	Quarry at Mülheim-Kärlich	50
Cement		HeidelbergCement AG	Plants at Blaubeuren-Schelklingen, Burglengenfeld, Hannover, Hassmersheim, Kieferssfelden, Leimen, and others	9,200 e
Do.		Dyckerhoff AG (Buzzi Unicem SpA, 76.73%, and other private, 23.27%)	Plants at Amoneburg, Golheim, Neuwied, Neubeckum, and others	5,600 e
Do.		SCHWENK Zement KG	Plants at Allmendingen, Bernberg, Karlstadt, and Mergelstetten	5,000 e
Do.		Anneliese Zementwerke AG (HeidelbergCement AG, 100%)	Plants at Ennigerloh, Geseke, and Paderborn	3,500 e
Do.		Deuna Zement GmbH (Dyckerhoff AG, 100%)	Plant at Deuna	3,000 e
Chalk		Vereinigte Kreidewerke Dammann KG	Quarries on Rügen Island, and plants at Lägerdorf and Söhlde	500
Clay, including ball and refractory clays		Stephan Schmidt KG	Tonbergbau Grube Anton open pit mine, Dornburg-Langendernbach, Müllenbach and Thewald Mines, Höhr-Grenzhausen; Wiesa-Thonberg and Cunnersdorf quarries, Kamenz-Wiesa, Westerwald region	1,400 e
Do.		Marx Bergbau GmbH & Co. KG (Stephan Schmidt KG, 100%)	Lämmersbach and Meudt Mines, Ruppach-Goldhausen quarry, Dornburg-Langendernbach, Westerwald region	300 e
Do.		Goerg & Schneider GmbH & Co.	Quarry and main plant at Boden, others at Mogendorf, Goddert, Siershahn, Wirges/Staudt, and Kettenbach/ Taunus, Westerwald region; others in Saxony and Eifel regions	NA
Do.		Mittelhessische Tonbergbau GmbH (Goerg & Schneider GmbH & Co., 50%, and Stephan Schmidt KG, 50%)	Quarry and plant in the Gießen/Lahn region	100
Do.		Rohstoffgesellschaft GmbH Ponholz	Mine and chamotte plant at Maxhütte-Haidoff, and Aufofweiher Mine, Bavaria	100
Do.		Adolf Gottfried Tonwerke GmbH	Quarries and plant near Grossheirath, Coburg, Bavaria	100

See footnotes at end of table.

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TABLE 2--Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[2]	Location of main facilities	Annual capacity
Coal, anthracite and bituminous		Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	West, Lohberg/Osterfeld, Walsum, Prosper-haniel, Lippe, Augusta Victoria/Blumenthal, and Ost Mines, Ruhr region, North Rhine-Westphalia	18,000
Do.		do.	Saar Mine, Saar Basin, Saarland	6,000
Do.		do.	Ibbenbüren Mine, Steinfurt District, North Rhine-Westphalia	2,100
Coke contained in domestic coal		Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	Two pitside coking plants at Ibbenbüren Mine and Lohberg/Osterfeld Mine	3,000
Do.		Thyssen Krupp Steel AG	Schwelgern plant at Duisburg	2,100
Do.		do.	About 2 other pitside coking plants, Ruhr region, North Rhine-Westfalia	2,000
Do.		Hüttenwerke Krupp Mannesmann GmbH (Thyssen Krupp Steel AG, 50%; Vallourec & Mannesmann Tubes SA, 20%; Mannesmannröhren-Werke GmbH, 30%)	Plant at Duisberg-Huckingen steel complex	1,100
Copper (cathodes)		Norddeutsche Affinerie AG (HSH Nordbank AG, 10%; Possehl Beteiligungsverwaltung GmbH, 10%; Other private, 80%)	Primary smelter and refinery and secondary plant at Hamburg	560 e
Do.		Hüttenwerke Kayser AG (Norddeutsche Affinerie AG, 100%)	Secondary plant and refinery at Lünen	185 e
Fluorspar		Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach	35
Graphite	metric tons	Graphit Kropfmühl AG	Mine and plant at Kropfmühl, Passau	20,000
Do.	do.	do.	Plants at Bad Godesberg and Wedel, Holstein	8,000
Gypsum		VG-ORTH GmbH & Co. KG	Mine and plant at Stadtoldendorf, and plants at Osterode, Spremberg, and Witzenhausen	150
Do.		Gyproc GmbH Baustoff Production & Co. KG	Mines and plant in Lower Saxony	110
Kaolin		WBB Fuchs GmbH & Co. KG, subsidiary of WBB Minerals plc (S.C.R.- Sibelco NV, 100%)	25 quarries and 8 plants, including 2 at Ransbach and Kannenbäckerland plant in Höhr-Grenzhausen, Westerwald region; also including quarries and plants of Kaolin- und Tonwerke Seilitz-Löthain, Saxony region	2,000
Do.		Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerke GmbH, 100%)	Mines at Caminau, Hirschau, Kemmlitz, and Schnaittenbach	300
Lead		Metaleurop Weser GmbH (Metaleurop S.A., 100%)	Smelter and refinery at Nordenham	120
Do.		Berzelius Metall GmbH	Primary smelter at Stolberg and secondary smelters at Braubach am Rhein and Freiberg/Sachsen	200
Do.		Sudamin MHD GmbH	Refinery at Duisburg	120
Do.		Norddeutsche Affinerie AG	Refinery at Hamburg	50
Lignite		RWE Power Aktiengesellschaft	Surface mines in Rhenish mining area: Bergheim, Garzweiler, Inden, and Hambach	105,000
Do.		Vattenfall Europe Mining AG	Surface mines in Lausatian mining area: Jänschwalde, Schwarze Pumpe, and Boxberg	60,000
Limestone		Harz-Kalk GmbH	Quarry at Rübeland	2,000 e
Do.		Kalkwerk Bad Kösen GmbH	Quarry at Bad Kösen	2,000 e
Do.		Fels-Werke GmbH	Quarry at Kaltes Tal	2,000 e
Do.		Schäfer Kalk GmbH & Co KG	Plants at Hahnstätten, Steeden, Stromberg, and Grevenbrück	3,000
Magnesium, secondary	metric tons	Norsk Hydro Magnesiumgesellschaft GmbH	Plant at Bottrop	26
Do.	do.	IMCO GmbH	Plant at Toeging	15
Natural gas	million cubic meters	BEB Erdgas-Erdöl GmbH (ExxonMobil Central Europe Holding GmbH, 50%)	Plants at Clenze and Grossenkmeten	9,500
Do.	do.	Mobil Erdgas-Erdöl GmbH (ExxonMobil Central Europe Holding GmbH, 100%)	Plants at Scholen	4,000

See footnotes at end of table.

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TABLE 2--Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[2]	Location of main facilities	Annual capacity
Petroleum:				
Crude		The largest companies were:	6 areas with about 85 oilfields, including:	
Do.	thousand 42-gallon barrels	BEB Erdgas-Erdöl GmbH	West of Ems River	30,000 e
Do.	do.	Wintershall AG (BASF AG, 100%)	Weser-Ems Rivers	21,000 e
Do.	do.	Deutsche Texaco AG	Elbe-Weser Rivers	20,000 e
Refined		The largest companies were:	About 20 refineries, including:	
Do.	do.	Deutsche Shell AG	Refineries at Godorf, Hamburg, and Grasbrook	256,000 e
Do.	do.	Esso Deutschland GmbH (ExxonMobil Central Europe Holding GmbH, 100%)	Refineries at Karlsruhe and Ingolstadt	245,000 e
Do.	do.	Ruhr Oel GmbH (Petróleos de Venezuela S.A., 50%, and BP Gelsenkirchen GmbH, 50%)	Refinery at Gelsenkirchen	215,500 e
Do.	do.	BAYERNOIL Raffineriegesellschaft mbH (OMV AG, 45%; Ruhr Oel GmbH, 25%; AGIP Deutschland GmbH, 20%; Deutsche BP AG, 10%)	Refinery at Neustadt-Donau	145,000 e
Potash, K_2O content		K+S Kali GmbH (K+S Aktiengesellschaft, 100%)	Mines at Bergmannssegen-Hugo, Niedersachen-Riedel, Salzdetfurth, Sigmundshall, Hattorf, Neuhof-Ellers, Sondershausen, and Wintershall	6,000
Salt (rock)		K+S Salz GmbH (K+S Aktiengesellschaft, 100%)	Mines at Bad Friedrichshall-Kochendorf, Braunschweig-Luneburg, Heilbronn, Riedel, Stetten, and Wesel (Borth)	15,000
Silicon, metal	metric tons	RW Silicium GmbH (Graphit Kropfmühl AG, 100%)	Four electric arc furnaces in plant at Pocking	27,500
Steel, crude		ThyssenKrupp Steel AG	Bruckhausen and Beeckerwerth plants, near Duisburg	11,000
Do.		Hüttenwerke Krupp Mannesmann GmbH (Thyssen Krupp Steel AG, 50%; Vallourec & Mannesmann Tubes SA, 20%; Mannesmannröhren-Werke GmbH, 30%)	Plant at Duisberg-Huckingen	6,000
Do.		Salzgitter AG	Plants at Peine and Salzgitter	5,100
Do.		Stahlwerke Bremen GmbH (Arcelor S.A., 100%)	Plant at Bremen	4,000
Do.		Mittal Steel Co. NV	Plant at Hamburg and two plants near Duisburg	2,800
Do.		Saarstahl AG (Struktur-Holding-Stahl GmbH & Co KG, 74.9%; Dillinger Hüttenwerke AG, 25.1%)	Plants at Völkingen, Burbach, und Neunkirchen	2,800
Do.		AG der Dillinger Hüttenwerke (Arcelor S.A., 51.25%; Saarstahl AG, 33.75%; Struktur-Holding-Stahl GmbH & Co KG, 15%)	Plant at Dillingen	2,500
Do.		EKO Stahl GmbH (Arcelor S.A., 100%)	Plant at Eisenhüttenstadt	2,500
Zinc, metal		Xstrata plc	Smelter at Nordenham	155 e
Do.		Ruhr-Zink GmbH	Refinery at Datteln	140
Do.		Sudamin MHD GmbH	Smelter at Duisburg	100

eEstimated; estimated data are rounded to no more than three significant digits. NA Not available.
[1]Table includes data available through November 2006.
[2]Many more industrial minerals companies are listed in the Industrial Minerals Directory, 2006.

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TABLE 3

GERMANY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity	Total	Destinations	
		United States	Other (principal[2])
METALS			
Aluminum:			
Bauxite, ore and concentrate	48,435	--	France 11,188; Austria 9,929; Belgium 8,670.
Oxides	294,405	--	Italy 87,733; United Kingdom 29,146; Netherlands 24,730.
Hydroxides thousand metric tons	529	38	Netherlands 134; United Kingdom 74; Sweden 50.
Ash and residue containing aluminum	16,992	--	Spain 5,828; Netherlands 4,044; Austria 2,923.
Metal, including alloys:			
Primary, not alloyed	63,132	--	Austria 26,957; Italy 13,889; Netherlands 10,417.
Primary, alloys, all forms	222,578	--	Austria 55,199; Belgium 30,493; Italy 19,587.
Secondary	179,029	--	France 36,343; Netherlands 33,478; Austria 28,108.
Scrap	613,688	--	Italy 152,808; Netherlands 104,327; Austria 101,872.
Antimony:			
Ore and concentrate	< 1	--	Switzerland, 100%.
Metal, including alloys, all forms	11	--	Romania 5; Taiwan 2; Japan 1.
Arsenic, metal, including alloys, all forms	14	5	China 4; Republic of Korea 2; United Kingdom 1.
Bismuth, metal, including alloys, all forms	221	40	Italy 40; France 38; Czech Republic 27.
Chromium, ore and concentrate	20,837	--	Czech Republic 5,793; Poland 3,834; Austria 3,813.
Cobalt:			
Ore and concentrate	367	--	Finland 250; Sweden 57; Belgium 29.
Oxides and hydroxides	233	--	China 77; Italy 35; Spain 31.
Metal, including alloys, all forms	537	--	United Kingdom 133; France 129; Turkey 49.
Scrap	494	158	Sweden 82; Canada 73; France 59.
Columbium (niobium), ore and concentrate, including tantalum	93	--	Unspecified 93.
Copper:			
Ore and concentrate	49,619	--	Sweden 47,386.
Matte and speiss, including cement copper	943	--	Canada 925.
Ash and residue containing copper	19,260	--	Belgium 10,632; Canada 4,391; Spain 1,714.
Metal, including alloys:			
Unrefined	53	--	Netherlands 20; Czech Republic 10; Slovenia 8.
Refined, not alloyed	148,256	24,907	France 50,259; Italy 31,430; United Kingdom 7,561.
Alloys, all forms	21,863	--	Italy 3,476; Switzerland 2,143; Austria 1,858.
Scrap	407,768	--	China 143,534; Netherlands 79,923; Belgium 39,146.
Gallium, indium, and thallium, metal including scrap	18	--	France 11; Netherlands 2; Denmark 1.
Germanium, oxides	433	--	United Kingdom 322; France 36; Italy 25.
Gold:			
Metal, including alloys, all forms kilograms	24,002	--	Unspecified 9,049; Thailand 3,216; Italy 2,184.
Waste and sweepings	30	6	Switzerland 16; Italy 7.
Iron and steel:			
Ore and concentrate	13,612	--	Slovakia 5,064; Luxembourg 4,737; Poland 1,307.
Pyrite, roasted	3,241	--	Switzerland 2,622; Other countries (Unspecified) 606.
Ash and residue containing iron thousand metric tons	891	--	France 493; Netherlands 132; Luxembourg 132.
Metal:			
Pig iron, cast iron, related materials	165,119	--	France 61,920; Belgium 23,282; Netherlands 22,456.
Scrap thousand metric tons	9,182	--	France 2,130; Luxembourg 1,680; Netherlands 1,634.
Sponge iron, powder	149,643	--	France 118,068; Unspecified 31,126.
Ferroalloys:			
Ferrochromium	29,288	5,184	France 4,071; Italy 3,661; Austria 3,192.
Ferromanganese	15,864	--	Austria 5,045; Switzerland 3,934; Hungary 1,459.
Ferromolybdenum	2,841	--	France 608; Belgium 435; Italy 403.
Ferronickel	625	--	Spain 433; France 86; Sweden 79.
Ferrosilicochromium	79	--	Netherlands 52; Malta 25.
Ferrosilicomagnesium	15,824	--	Italy 6,425; France 3,054; Netherlands 1,424.
Ferrosilicomanganese	9,340	--	Luxembourg 3,493; France 2,372; Switzerland 1,196.
Ferrosilicon	66,995	--	France 18,156; Austria 13,533; Belgium 10,116.

See footnotes at end of table.

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TABLE 3--Continued
GERMANY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal[2])
METALS--Continued				
Iron and steel, metal, ferroalloys--Continued:				
Ferrotungsten		183	--	Austria 42; Italy 36; China 27.
Ferrotitanium		3,796	--	Sweden 854; Italy 501; France 475.
Ferrovanadium		876	--	Italy 300; Spain 190; Austria 105.
Ferroniobium		1,424	--	Ukraine 261; Belgium 236; France 188.
Other ferroalloys		39,116	--	France 5,515; Italy 4,498; Japan 3,442.
Steel, crude		2,780	--	Romania 528; Australia 339; Mexico 264.
Lead:				
Ore and concentrate		3,423	--	Belgium 3,423.
Lead containing antimony		17,582	--	Czech Republic 10,831; Austria 2,848; Poland 1,776.
Metal, including alloys:				
Alloys, all forms		41,714	--	France 24,278; Spain 5,923; Czech Republic 5,548.
Refined		62,839	--	Czech Republic 19,040; France 12,882; Netherlands 11,939.
Unrefined		116	--	Spain 94; Greece 20.
Scrap		19,662	--	Belgium 9,261; Netherlands 6,017; France 2,772.
Lithium:				
Carbonate		2,660	--	France 702; Belgium 628; Republic of Korea 271.
Oxides and hydroxides		624	--	France 142; United Kingdom 125; Spain 113.
Magnesium, metal, including alloys:				
Scrap		17,028	--	Czech Republic 7,067; Austria 4,904; Netherlands 1,924.
Unwrought		5,214	--	Romania 1,496; Hungary 1,006; Austria 850.
Manganese, ore and concentrate		2,872	--	Belgium 2,375; France 181.
Mercury		56	22	India 5; Liechtenstein 4; Ecuador 4.
Molybdenum, ore and concentrate		2,309	--	China 933; Netherlands 563; Belgium 480.
Nickel:				
Matte, speiss, related materials		644	--	Canada 644.
Oxides and hydroxides		105	--	Japan 73; Canada 7; Sweden 6.
Ash and residue containing nickel		643	--	Sweden 330; Netherlands 257; Austria 57.
Metal, including alloys:				
Alloys, all forms		8,775	--	Austria 6,994; Sweden 1,088.
Unalloyed		5,753	--	Austria 1,749; France 863; Czech Republic 627.
Scrap		9,255	1,860	Netherlands 3,369; France 824; Austria 592.
Platinum-group metals:				
Waste and sweepings		812	624	United Kingdom 99; Belgium 50.
Metal, including alloys, all forms:				
Platinum	kilograms	27,898	4,408	Belgium 6,221; China 4,603; Switzerland 4,296.
Palladium	do.	12,497	3,112	Switzerland 2,162; Brazil 1,425; Japan 937.
Rhodium	do.	3,866	928	Belgium 785; Japan 665; Switzerland 503.
Iridium, osmium and ruthenium	do.	2,512	859	Hong Kong 631; United Kingdom 271; Italy 196.
Rare-earth metals, including alloys:				
Metal		4	--	Turkey 2; Austria < 1; Czech Republic < 1.
Compounds, all forms		91	--	Austria 13; Malaysia 10; Japan 9.
Selenium, elemental		235	--	Belgium 40; United Kingdom 33; Mexico 20.
Silicon, metal		18,717	--	Italy 3,800; Austria 3,594; Slovenia 2,789.
Silver:				
Ore and concentrate		< 1	--	Switzerland, 100%.
Metal		1,720	--	Unspecified 1,013; Turkey 160; France 98.
Powder	kilograms	60,297	3,618	France 18,451; Italy 13,084; Japan 7,597.
Tin:				
Ore and concentrate		< 1	--	Czech Republic, 100%.
Ash and residue containing tin		931	--	Belgium 880.
Metal, including alloys		1,572	--	Netherlands 421; Poland 156; Belgium 141.
Scrap		1,143	--	France 568; Austria 331; Belgium 134.
Titanium, ore and concentrate		319	--	Italy 82; Mexico 76; Austria 56.

See footnotes at end of table.

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TABLE 3--Continued
GERMANY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal[2])
METALS--Continued				
Tungsten:				
Ore and concentrate		6	--	Austria 6.
Metal, including alloys:				
Metal		742	--	Unspecified 716.
Scrap		1,942	456	Austria 542; United Kingdom 318; Sweden 184.
Wolframite		3,186	--	Unspecified 3,186.
Vanadium, oxides and hydroxides		296	--	Unspecified 296.
Zinc:				
Ore and concentrate		1,632	--	Belgium 909; United Kingdom 689.
Matte and related materials		9,781	--	Belgium 1,946; Netherlands 1,790; Luxembourg 1,604.
Blue powder		4,697	573	Switzerland 803; China 465; Austria 409.
Ash and residue containing zinc		13,438	--	Belgium 8,708; Netherlands 4,058.
Metal, including alloys:				
Alloys, all forms		37,897	--	Austria 22,852; France 4,699; Italy 3,790.
Unalloyed		97,074	--	France 31,355; United Kingdom 26,889; Austria 7,960.
Scrap		54,284	--	Belgium 15,471; China 14,711; Netherlands 6,623.
Zirconium:				
Ore and concentrate		2,567	--	Austria 698; Belgium 357; France 208.
Metal, including alloys		35	18	Japan 5; France 3.
INDUSTRIAL MINERALS				
Abrasives, natural:				
Corundum, emery, garnet, etc.		4,259	--	Sweden 1,567; Switzerland 848; Netherlands 622.
Pumice		94,572	--	Netherlands 40,855; Luxembourg 34,330; Switzerland 7,755.
Asbestos, crude		7	--	Switzerland 7.
Barite and witherite		32,383	--	Unspecified 32,383.
Borates, natural, crude, including calcined		33	--	Czech Republic 20; Switzerland 10; South Africa 3.
Cement	thousand metric tons	6,185	--	Netherlands 2,437; Belgium 841; France 421.
Chalk, natural		116,065	--	Netherlands 30,641; Belgium 24,142; Sweden 17,410.
Clays, crude:				
Bentonite		60,953	--	Austria 13,836; Switzerland 13,166; France 8,107.
Kaolin		417,606	--	Austria 120,688; Italy 107,742; Netherlands 45,101.
Other, unspecified	thousand metric tons	2,461	--	Italy 945; Netherlands 743; Belgium 317.
Diamond, natural:				
Gem, not set or strung	carats	190,272	18,266	Thailand 30,634; Switzerland 25,306; Hong Kong 21,501.
Industrial stones	do.	7,997	--	Austria 3,095; Switzerland 1,256; Thailand 1,248.
Dust and powder	kilograms	10,863	--	Austria 2,064; Italy 1,782; United Kingdom 1,238.
Diatomite and other infusorial earth		21,073	--	Switzerland 13,676; Austria 3,772.
Feldspar		131,383	--	France 59,385; Italy 25,488; Spain 12,481.
Fluorspar:				
Acid-grade		8,953	--	Sweden 1,934; Hungary 1,603; Belgium 1,155.
Metallurgical-grade		8,676	--	Luxembourg 2,212; Czech Republic 2,048; Poland 2,022.
Graphite, natural		14,652	--	Czech Republic 2,974; France 2,198; Sweden 1,114.
Gypsum and plaster	thousand metric tons	1,349	--	Belgium 325; Netherlands 224; Norway 186.
Kyanite and related materials:				
Andalusite, kyanite, sillimanite		1,968	--	Hungary 661; Italy 529; Austria 244.
Mullite		12,879	3,104	United Kingdom 2,705; Italy 1,700; Hungary 1,494.
Lime, hydrated	thousand metric tons	1,036	--	Netherlands 663; France 132; Belgium 102.
Magnesium compounds:				
Magnesite, crude, including burned		73,127	--	Austria 24,936; France 21,426; Slovakia 5,777.
Epsomite		713,247	--	France 178,312; Malaysia 153,348; Indonesia 104,134.
Mica, crude, including splittings and waste		3,890	--	Italy 1,039; Brazil 1,031; Austria 490.
Peat, natural	thousand metric tons	2,737	--	Netherlands 1,322; France 317; Italy 293.

See footnotes at end of table.

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TABLE 3--Continued
GERMANY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal[2])
INDUSTRIAL MINERALS--Continued				
Phosphates:				
Crude		< 1	--	Poland, 50%; Switzerland, 50%.
Milled		43	--	Czech Republic 21; Kazakhstan 10; Russia 6.
Precious and semiprecious stones, natural (other than diamond):				
Gem, not set or strung		776	--	Hong Kong 367; India 148; Thailand 57.
Industrial stones	grams	5,608	--	United Kingdom 3,656; France 1,952.
Pyrite, unroasted		339	--	France 119; Poland 62; Saudi Arabia 60.
Salt and brine	thousand metric tons	3,207	--	Belgium 638; Netherlands 552; Czech Republic 468.
Stone, sand and gravel:				
Basalt, lava rocks, etc.		195,561	--	Netherlands 166,618; Switzerland 24,250.
Dimension stone:				
Dolomite and limestone	thousand metric tons	744	--	Luxembourg 504; Netherlands 80; Belgium 45.
Granite		68,438	--	Switzerland 57,899.
Marble, travertine, etc.		191,278	--	Switzerland 65,800; Netherlands 53,558; Belgium 28,500.
Foundation sand and gravel		190,492	--	Switzerland 99,818; Austria 68,196; France 19,621.
Limestone for cement		119,765	--	Luxembourg 87,069; France 10,539; Netherlands 9,581.
Quartz and quartzite		114,619	--	Netherlands 87,454; Austria 7,565.
Quartz sand	thousand metric tons	10,229	--	Netherlands 7,078; Belgium 1,913.
Sandstone		8,358	--	Netherlands 5,650; Austria 1,028.
Schist and shale		21,330	--	Belgium 8,148; Netherlands 3,711; Austria 2,837.
Unworked stone, natural	thousand metric tons	10,279	--	Netherlands 7,113; Belgium 1,264; Switzerland 884.
Other natural stone, unspecified	do.	5,561	--	Netherlands 3,887; France 790; Switzerland 295.
Sulfur, crude, including native and byproduct	do.	931	--	Belgium 129; Morocco 111; Senegal 110.
Talc, steatite, soapstone, pyrophyllite		3,890	--	France 657; Romania 529; Netherlands 331.
Vermiculite, perlite, chlorite		3,172	--	Austria 1,050; Poland 374; France 352.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural		110,261	--	Netherlands 18,965; Luxembourg 14,665; Denmark 12,680.
Coal:				
Anthracite		8,761	--	Croatia 5,239; Austria 850; Netherlands 534.
Lignite	thousand metric tons	49	--	Austria 29; United Kingdom 16.
Other bituminous, including briquets		231,708	--	France 109,366; Belgium 74,610; Austria 31,512.
Coke:				
Of anthracite and bituminous coal		100,824	--	Netherlands 39,422; United Kingdom 24,299; France 13,208.
Of lignite		10,389	--	Austria 4,415; Czech Republic 2,431; Canada 1,808.
Gas, natural, gaseous	thousand metric tons	20,967	--	Unspecified 20,967.
Petroleum, crude	do.	1,253	--	United Kingdom 1,131; Belgium 84.
Uranium, natural:				
Crude, U content	kilograms	135,807	--	Argentina 102,127; Netherlands 33,409.
Enriched, fissile isotopes	do.	15,412	8,400	Belgium 2,635; Sweden 2,481; United Kingdom 786.

-- Less than 5%.

[1]Source: Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, Table1.2—Rohstoffsituation, 2004: Hannover, Germany, October.

[2]Destination country imported at least 5% of Germany's total exports of the mineral commodity.

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TABLE 4

GERMANY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal[2])
METALS				
Aluminum:				
Bauxite, ore and concentrate	thousand metric tons	2,147	--	Guinea 1,737; Greece 116.
Oxides	do.	1,111	--	Jamaica 434; Ireland 207; Spain 146.
Hydroxides		205,376	--	Ireland 138,423; Hungary 27,931; France 11,706.
Ash and residue containing aluminum		176,613	--	France 54,220; Netherlands 43,094; Denmark 23,843.
Metal, including alloys:				
Primary, not alloyed	thousand metric tons	648	--	Russia 145; Netherlands 107; Brazil 101.
Primary, alloys, all forms	do.	769	--	Norway 170; Netherlands 168; United Kingdom 151.
Secondary		440,369	--	United Kingdom 107,450; Netherlands 47,560; Austria 40,954.
Scrap		497,180	--	Netherlands 84,023; Russia 71,594; Austria 45,741.
Antimony:				
Ore and concentrate		15	--	Russia 15.
Metal, including alloys, all forms		277	--	Belgium 100; China 99; Kyrgyzstan 41.
Arsenic, metal, including alloys, all forms		4	2	China 2.
Bismuth, metal, including alloys, all forms		1,679	--	United Kingdom 1,128; Mexico 480.
Chromium, ore and concentrate		132,429	--	South Africa 76,809; Turkey 39,861; Netherlands 6,754.
Cobalt:				
Ore and concentrate		21	--	Congo (Kinshasa) 9; Norway 5; Czech Republic 3.
Oxides and hydroxides		484	--	Finland 235; Belgium 64; Netherlands 36.
Metal, including alloys, all forms		2,014	266	Belgium 441; United Kingdom 236; Finland 213.
Scrap		294	36	United Kingdom 45; Netherlands 38; South Africa 37.
Columbium (niobium):				
Ore and concentrate, including tantalum		80,659	--	Unspecified 80,659.
Scrap containing both niobium and tantalum		383	--	Belgium 240; Japan 85; Thailand 36.
Copper:				
Ore and concentrate	thousand metric tons	1,142	--	Chile 471; Peru 161; Argentina 156.
Matte and speiss, including cement copper		15,086	--	Mexico 10,711; Bulgaria 1,478; Morocco 1,418.
Ash and residue containing copper		49,837	4,435	Italy 10,366; Ukraine 5,980; Netherlands 5,881.
Metal, including alloys:				
Unrefined		11,635	--	Armenia 6,911; Belgium 3,002.
Refined, not alloyed	thousand metric tons	644	--	Russia 209; Chile 161; Poland 102.
Alloys, all forms		26,055	--	Belgium 4,664; United Kingdom 4,481; Poland 3,908.
Scrap		500,748	--	France 67,100; Netherlands 45,568; United Kingdom 40,060.
Gallium, indium, and thallium, metal, including scrap		39	4	China 11; United Kingdom 8; France 8.
Germanium, oxides		2,821	632	France 810; China 513; United Kingdom 378.
Gold:				
Metal, including alloys, all forms	kilograms	39,024	--	Belgium 12,175; Switzerland 6,088; Sweden 5,385.
Waste and sweepings		1,379	--	Australia 416; United Kingdom 371; Austria 305.
Iron and steel:				
Ore and concentrate	thousand metric tons	46,394	--	Brazil 25,981; Canada 6,959; Sweden 4,407.
Pyrite, roasted		37,194	--	Norway 36,153.
Ash and residue containing iron		218,465	--	Austria 140,036; Poland 46,533; Luxembourg 26,434.
Metal:				
Pig iron, cast iron, related materials		404,547	--	Russia 100,732; Netherlands 67,964; Canada 61,896.
Scrap	thousand metric tons	6,298	--	Netherlands 1,568; Poland 1,020; Czech Republic 819.
Sponge iron, powder		181,153	--	Trinidad & Tobago 99,996; Sweden 31,883; Canada 28,622.
Ferroalloys:				
Ferrochromium		464,049	--	South Africa 329,475; Netherlands 63,575; Russia 24,595.
Ferromanganese		215,700	--	France 67,298; South Africa 44,219; China 28,041.
Ferromolybdenum		14,305	--	Belgium 5,937; United Kingdom 1,760; Armenia 1,287.
Ferronickel		129,300	--	United Kingdom 56,375; Venezuela 29,739; Greece 21,593.
Ferrosilicochromium		11,391	--	Russia 5,194; Belgium 4,294; Unspecified 1,310.
Ferrosilicomagnesium		1,735	--	Slovenia 989; Argentina 227; France 186.

See footnotes at end of table.

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TABLE 4--Continued
GERMANY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal[2])
METALS--Continued				
Iron and steel, metal, ferroalloys--Continued:				
Ferrosilicomanganese		183,564	--	China 32,307; Norway 25,332; Ukraine 24,965.
Ferrosilicon		248,584	--	Norway 77,558; Poland 45,491; France 27,344.
Ferrotungsten		480	--	China 312; Netherlands 90; Austria 43.
Ferrotitanium		8,141	--	United Kingdom 3,305; Russia 1,929; Netherlands 1,628.
Ferrovanadium		4,517	--	Austria 2,055; Russia 565; Netherlands 375.
Ferroniobium		4,345	--	Brazil 3,624; Canada 591.
Other ferroalloys		71,334	--	France 30,674; United Kingdom 7,419; Italy 6,063.
Steel, crude		13,489	--	Czech Republic 8,161; United Kingdom 3,332.
Lead:				
Ore and concentrate		207,411	--	Australia 48,534; Sweden 41,897; Poland 30,697.
Lead containing antimony		27,988	--	Sweden 7,025; Belgium 6,913; Ukraine 3,750.
Metal, including alloys:				
Alloys, all forms		12,621	--	United Kingdom 7,686; Netherlands 1,350; Poland 1,237.
Refined		83,896	--	United Kingdom 24,498; Sweden 15,353; Poland 15,101.
Unrefined		19,993	--	Poland 9,877; Belgium 5,598; Switzerland 2,219.
Scrap		60,574	--	United Kingdom 28,349; Netherlands 11,691; Poland 4,180.
Lithium:				
Carbonate		7,189	827	Chile 5,823.
Oxides and hydroxides		3,698	784	Switzerland 2,278; Russia 436.
Magnesium, metal, including alloys:				
Scrap		18,948	--	China 10,857; Austria 3,107; Switzerland 1,857.
Unwrought		45,392	--	China 20,971; Czech Republic 7,444; Austria 7,172.
Manganese, ore and concentrate		8,636	760	Netherlands 3,273; Belgium 1,434; France 1,174.
Mercury		81	--	Switzerland 51; Netherlands 11; Peru 10.
Molybdenum, ore and concentrate		13,590	3,112	Chile 3,574; Netherlands 2,120; China 1,332.
Nickel:				
Matte, speiss, related materials		7,264	--	Netherlands 7,249.
Oxides and hydroxides		603	--	Czech Republic 196; Canada 164; Japan 79.
Ash and residue containing nickel		11,101	--	Netherlands 5,184; United Kingdom 1,432; Singapore 977.
Metal, including alloys:				
Alloys, all forms		2,032	--	United Kingdom 772; Netherlands 343; Austria 287.
Unalloyed		88,288	--	Russia 36,110; United Kingdom 19,335; Norway 7,063.
Scrap		11,973	635	Austria 2,442; United Kingdom 1,293; Russia 1,137.
Platinum-group metals:				
Waste and sweepings		4,500	342	Netherlands 540; France 464; South Africa 446.
Metal, including alloys, all forms:				
Platinum	kilograms	56,087	5,497	Belgium 26,193; South Africa 14,527; United Kingdom 5,497.
Palladium	do.	25,115	1,331	South Africa 7,007; United Kingdom 6,731; Belgium 5,651.
Rare-earth metals, including alloys:				
Metal		288	--	China 137; Austria 120.
Compounds, all forms		1,139	--	China 519; France 319; Austria 222.
Selenium, elemental		299	--	Sweden 118; Russia 84; Canada 24.
Silicon, metal		133,144	--	Norway 45,535; Brazil 34,351; France 21,170.
Tin:				
Ore and concentrate		1	--	Kazakhstan 1.
Ash and residue containing tin		1,178	--	Netherlands 908; Belgium 165; United Kingdom 79.
Metal, including alloys		21,955	--	Peru 5,489; Indonesia 4,193; Belgium 3,227.
Scrap		428	--	France 220; Netherlands 53; Slovakia 36.
Titanium, ore and concentrate		542,692	--	Norway 245,297; South Africa 133,502; Canada 125,362.
Tungsten:				
Ore and concentrate		389	--	Vietnam 81; Russia 76; Nigeria 57.

See footnotes at end of table.

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TABLE 4--Continued

GERMANY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal[2])
METALS--Continued				
Tungsten--Continued:				
Metal, including alloys:				
Metal		1,841	125	Canada 716; Austria 569; China 134.
Scrap		3,175	876	United Kingdom 476; Austria 371; Netherlands 187.
Wolframite		815	187	China 262; Ireland 225; Russia 140.
Vanadium, oxides and hydroxides		649	--	South Africa 460; China 100; United Kingdom 51.
Zinc:				
Ore and concentrate		495,066	72,775	Sweden 121,786; Ireland 104,954; Belgium 64,854.
Matte and related materials		13,793	--	Netherlands 3,683; Belgium 3,476; United Kingdom 2,772.
Blue powder		7,341	--	Belgium 5,080; Norway 1,263; Switzerland 470.
Ash and residue containing zinc		18,026	1,370	Netherlands 3,010; Switzerland 2,758; Poland 2,343.
Metal, including alloys:				
Alloys, all forms		85,062	--	Belgium 51,973; France 13,525; Finland 11,739.
Unalloyed		259,802	--	Spain 77,421; Finland 49,622; Netherlands 36,632.
Scrap		24,382	--	France 9,997; Netherlands 4,754; United Kingdom 2,194.
Zirconium, metal, including alloys		134	--	Netherlands 100; China 25.
INDUSTRIAL MINERALS				
Abrasives, natural:				
Corundum, emery, garnet, etc.		11,887	--	India 7,810; Netherlands 1,379; Japan 618.
Pumice		55,099	--	Italy 30,690; Iceland 22,480.
Asbestos, crude		69	10	Canada 59.
Barite and witherite		228,477	--	China 143,941; France 49,123; Netherlands 15,308.
Borates, natural, crude, including calcined		11,335	--	Netherlands 3,627; Turkey 3,559; Belgium 2,936.
Cement	thousand metric tons	1,993	--	Belgium 448; Czech Republic 438; France 430.
Chalk, natural		256,953	--	Netherlands 120,254; France 86,079; Belgium 35,716.
Clays, crude:				
Bentonite		312,160	--	Netherlands 144,530; Czech Republic 47,136; Italy 39,332.
Kaolin	thousand metric tons	801	190	Czech Republic 174; United Kingdom 151; Netherlands 143.
Other, unspecified		217,941	50,344	Czech Republic 61,677; United Kingdom 20,051; Netherlands 15,910.
Diamond, natural:				
Gem, not set or strung	carats	513,371	--	Belgium 181,220; India 175,573; Israel 52,877.
Industrial stones	thousand carats	764	62	Ireland 241; United Kingdom 228; South Africa 108.
Dust and powder	kilograms	19,312	8,864	Ireland 6,373; China 985.
Diatomite and other infusorial earth		104,531	12,021	Spain 49,130; Denmark 21,011; France 11,812.
Feldspar		73,579	--	Norway 22,368; France 19,793; Austria 9,860.
Fluorspar:				
Acid-grade		28,224	--	China 26,841.
Metallurgical-grade		281,567	--	South Africa 92,072; China 86,441; Namibia 69,265.
Graphite, natural		53,966	--	China 19,806; Netherlands 19,428; Unspecified 8,581.
Gypsum and plaster		236,074	--	France 89,944; Austria 61,615; Poland 42,021.
Kyanite and related materials:				
Andalusite, kyanite, sillimanite		59,432	3,150	South Africa 23,832; France 10,698; Belgium 9,569.
Mullite		4,822	743	Hungary 2,252; United Kingdom 984; Luxembourg 420.
Lime, hydrated	thousand metric tons	456	--	France 219; Czech Republic 129; Belgium 64.
Magnesium compounds:				
Magnesite, crude, including burned		399,824	--	China 121,546; Netherlands 83,163; Slovakia 60,773.
Epsomite		371	--	France 159; Netherlands 111; Belgium 101.
Mica, crude, including splittings and waste		30,576	--	India 11,588; France 9,815; United Kingdom 2,385.
Peat, natural		565,172	--	Estonia 149,771; Netherlands 146,380; Latvia 141,858.
Phosphates:				
Crude		129,848	--	Israel 95,438; Netherlands 20,646; Russia 13,634.
Milled		18,484	--	Belgium 17,227.
Potash, K_2O content	kilograms	270,795	--	Israel 261,588.

See footnotes at end of table.

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TABLE 4--Continued

GERMANY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004[1]

(Metric tons unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal[2])
INDUSTRIAL MINERALS--Continued				
Precious and semiprecious stones, natural (other than diamond):				
Gem, not set or strung		1,943	--	Brazil 729; Madagascar 402; South Africa 233.
Industrial stones	grams	16,100	1,546	United Kingdom 5,506; China 5,345; Taiwan 3,703.
Pyrite, unroasted		55,072	--	Finland 50,556.
Salt and brine	thousand metric tons	2,636	--	Netherlands 2,125.
Stone, sand and gravel:				
Basalt, lava rocks, etc.		76,308	--	Norway 35,941; Italy 11,294; China 7,554.
Dimension stone:				
Dolomite and limestone		704,680	--	Estonia 326,972; Belgium 273,416; Netherlands 69,059.
Granite		309,684	--	China 48,620; Sweden 45,833; Poland 41,807.
Marble, travertine, etc.	thousand metric tons	2,659	--	Norway 1,383; Austria 907; Italy 258.
Foundation sand and gravel		11,696	--	Switzerland 11,696.
Limestone for cement	thousand metric tons	2,166	--	Poland 1,007; Austria 520; Belgium 327.
Quartz and quartzite		87,121	--	Austria 41,731; Brazil 15,420; Belgium 10,890.
Quartz sand	thousand metric tons	1,831	--	France 1,186; Netherlands 339; Belgium 134.
Sandstone		37,309	--	India 11,305; Italy 9,663; Poland 5,634.
Schist and shale		31,921	--	France 28,537.
Natural stones, unworked	thousand metric tons	1,954	--	France 1,667.
Other natural stone, unspecified	do.	6,308	--	Norway 3,419; United Kingdom 1,167; Sweden 542.
Sulfur, crude, including native and byproduct		57,088	--	Belgium 24,034; Netherlands 12,502; Czech Republic 4,852.
Talc, steatite, soapstone, pyrophyllite		359,543	--	Netherlands 114,335; France 68,673; Austria 63,639.
Vermiculite, perlite, chlorite		132,013	--	Greece 100,858; Hungary 15,578; South Africa 11,617.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural		28,763	6,328	Switzerland 4,487; Austria 4,314; Trinidad & Tobago 4,084.
Coal:				
Bituminous:				
Anthracite	thousand metric tons	2,271	193	South Africa 843; Russia 456; Colombia 232.
Coke	do.	8,013	417	Poland 1,827; Australia 1,506; China 1,386.
Semicoke, coking coal	do.	5,504	732	Australia 2,554; Canada 2,036.
Other, including briquets	do.	26,516	--	South Africa 6,762; Poland 5,993; Russia 4,905.
Lignite, all forms	do.	104	--	Czech Republic 94; Poland 9.
Gas, natural, gaseous	do.	77,414	--	Unspecified 77,414.
Petroleum, crude	do.	112,675	--	Russia 35,267; Norway 20,732; United Kingdom 19,380.
Uranium, natural:				
Crude, U content		930	--	Canada 436; United Kingdom 238; Russia 179.
Enriched, fissile isotopes	kilograms	25,220	--	France 9,004; United Kingdom 7,743; Russia 4,414.

-- Less than 5%

[1]Source: Bundesanstalt für Geowissenschaften und Rohstoffe, 2005, Table1.1—Rohstoffsituation, 2004: Hannover, Germany, October.

[2]Source country was responsible for at least 5% of Germany's total imports of the mineral commodity.

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THE MINERAL INDUSTRY OF GREECE

By Harold R. Newman

The mineral industry, which consisted of the sectors that mine and process metallic and nonmetallic minerals, was a small but important segment of the Greek economy. The majority of mining companies were well organized and well developed and had a strong export orientation.

The metallic minerals sector involved a relatively small number of large capital-intensive companies that were, in some cases, vertically integrated; that is, they were engaged in both mining and metallurgical processing. Typical examples were Aluminium de Grèce S.A., which was a producer of bauxite, alumina, and aluminum, and Larco G.M.M. S.A. (Larco), which mined laterite and operated the ferronickel plant at Larymna. Larco was the sole manufacturer of ferronickel in the European Union (EU). Companies dealing with industrial minerals were generally smaller in size but more numerous. They produced and commercialized a range of different products that addressed a variety of applications (Choose Media S.A., 2005§[1]).

Greece has a land area of 130,800 square kilometers (km^2); borders the Aegean, the Ionian, and the Mediterranean Seas; and is located between Albania and Turkey. The country is peninsular with an archipelago of about 2,000 islands (U.S. Central Intelligence Agency, 2006a§).

In 2005, the gross domestic product (GDP) based on purchasing power parity was $248.5 billion, and the per capita income based on purchasing power parity was $22,392. The annual GDP growth rate was estimated to be 4.0%, the inflation rate was 3.5%, and the unemployment rate was 10% (International Monetary Fund, 2006§).

Government Policies and Programs

Greece has a capitalist economy with a public sector that accounts for about 40% of the GDP; its per capita GDP is about 75% of that of the leading eurozone economies. The country was a major beneficiary of EU aid, which was equal to about 3.3% of the annual GDP. Despite strong growth, Greece has failed since 2000 to meet the EU's Growth and Stability Pact budget deficit criteria of 3% of the GDP; inflation, public debt, and unemployment were also above the eurozone average. Further restructuring of the economy would need to include privatization of several state enterprises, pension and other reforms, and minimizing bureaucratic inefficiencies to help meet budget deficit criteria (U.S. Central Intelligence Agency, 2006a§).

Environmental Issues

Environmental concern is the responsibility of the Ministry of Environment, Town Planning, and Public Works. The Government takes an active role in environmental protection. The general laws that have been enacted by the Government included law 1360/76 (Site Arrangement and Environment), Presidential Executive Order 1180/81, and law 1650/86 (Environmental Protection) and form the basis of the active legislative framework. The main environmental issues were air pollution and water pollution. Greece's natural hazard was severe earthquakes.

Production

Because northern Greece was thought to contain a significant amount of exploitable mineral resources, it received the most attention in exploration activities. In 2005, activities continued to be directed toward the search for gold. In terms of the value of production, bauxite was the most important of Greece's mineral commodities. Greece was a leading producer of bauxite, magnesite, nickel, and perlite in the EU (table 1). Major commodities and companies are listed in table 2.

Trade

In 2005, exports totaled $18.5 billion, of which $884 million went to the United States. Imports totaled $48 billion, of which $1,190 million was received from the United States. Exports of such minerals as bauxite, bentonite, nickel, and perlite made up a major share of total revenues. About 50% of the country's mineral production was exported (U.S. Central Intelligence Agency, 2006b§).

Commodity Review

Metals

Aluminum.—S&B controls the most significant bauxite reserves in Europe. The reserves were of diasporic and boehmitic type. Although the bauxite ore had an average alumina content of 53%, it also had a high silica content that made it hard to process. Production was distributed between open pit and underground mining. Of all the bauxite mined, the recovery rate was about 85%; the bauxite, in turn, was used as a raw material for the production of aluminum by electrolytic reduction. About 10% of the production was nonmetallurgical grade (Hellenic Center for Investment, 2005b§). Aluminium de Grèce S.A. (AdG) established its alumina and aluminum plants in 1960 at Agios Nikolaos on the northern coast of the Gulf of Corinth to take advantage of the important bauxite deposits. The site combines proximity to the large bauxite deposits of Boeotia and Phokifda, which were mined by Delphi-Distomon S.A. (a subsidiary of AdG), and sea transportation facilities.

Alcan Inc. of Canada announced that it had completed the sale of its controlling interest in AdG to Mytilineos Holdings S.A. of Greece. This followed the approval by the Greek Competition Commission and the Greek Ministry of Development. Mytilineos acquired a 53% equity interest in AdG at a cost of

[1]References that include a section mark (§) are found in the Internet References Cited section.

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about $107 million. Mytilineos was one of Greece's leading players in the defense, energy, and metallurgy sectors (Alcan Inc., 2005§).

Greece was the leading bauxite producer in the EU. Bauxite is the principal raw material used in the production of alumina. The major bauxite deposits are located and developed within the Parnassos-Ghiona geotectonic zone that includes Giona, Elikonas, Parnassos, and the Oeti mountain region. Delphi-Distomon S.A. (a subsidiary of S&B Industrials S.A.) produced about 1 million metric tons per year (Mt/yr) of bauxite, which was sold to AdG's operation at Boeotia. Almost 72% of the market was covered by domestic production; the remaining 28% was covered by imports (Hellenic Competition Commission, 2005).

Gold.—Greenwich Resources plc reported that an appeal against its Sappes gold project was upheld by the Conseil d'État (State Counsel). The court was the country's highest authority regarding administrative acts, and its decision to uphold an appeal against the Sappes preapproval study (PAS) could result in the PAS being annulled. If the PAS were to be annulled, then Greenwich would be able to resubmit the Sappes project environmental impact study under more recent legislation, which does not require a PAS (Mining Journal, 2005).

In November 2004, European Goldfields Ltd. acquired a 65% interest in Hellas Gold S.A.; Aktor S.A., which was Greece's leading construction company, held the remaining 35%. These assets in northern Greece included three near-production deposits with a 70-year concession that covers an area of 317 km^2. The properties include the polymetallic deposits of Olympias and Stratoni, which contain gold, lead, silver and zinc, and the copper-gold porphyry deposit referred to as Skouries. All three deposits have been well defined with more than 200,000 meters (m) of drilling and the completion of feasibility studies and engineering studies (European Goldfields Ltd., 2006§).

In September 2005, Hellas Gold initiated startup procedures at the Stratoni Mine. Production of ore was expected to reach 170,000 metric tons (t) by the end of 2006 and to increase steadily to 400,000 metric tons per year (t/yr) by 2010. Based on historical production levels, the Stratoni Mine was expected to produce grades of between 8% and 10% lead, 8% to 10% zinc, and 200 grams per metric ton (g/t) silver, with concentrator metal recoveries of about 90%. The total estimated proven and probable reserves at Stratoni were 1.9 million metric tons (Mt) at grades of 8.1% lead, 10.8% zinc, and 190 g/t silver (European Goldfields Ltd., 2006§).

Hellas Gold entered into offtake agreements with Euromin S.A. of Italy, MDIL (UK) Ltd., and Trafigura Beheer B.V. of the Netherlands for the sale of lead/silver concentrates and zinc concentrates produced at Stratoni. Under the offtake agreements, Hellas Gold agreed to sell concentrates that represented about 90% of all projected production for 2005, 2006, and 2007; 65% of lead/silver production; and 25% of zinc production for 2008 (Metal Bulletin, 2005).

Frontier Pacific Mining Corp. acquired a 100% interest in Thracean Gold Mining S.A.'s Perama Hill project at yearend 2004 and, in 2005, was proceeding with the permitting and social acceptance aspects of the project. The Perama Hill project is a high-grade oxide gold deposit. Roscoe Postle Consultants of Canada estimated the mineral resources, at a 1.0 g/t gold cutoff grade, to be 11.7 Mt at an average grade of 3.6 g/t gold and 8.3 g/t silver. The proposed annual milling rate was 1.25 Mt/yr through a conventional carbon-in-leach plant. The mine life was estimated to be 9 years (Frontier Pacific Mining Corp., 2005§).

Iron and Steel.—Corinth Pipeworks S.A. (CPW) was a steel pipe and hollow sections manufacturer for the construction, natural gas, petroleum, and water industries. CPW had a capacity of 700,000 t/yr. The Thisvi plant, which had two mills and lining and coating facilities, offered a wide range of products and services. The plant produced and coated medium- and large-diameter welded steel pipes and hollow sections with anticorrosive materials (externally and/or internally) (Corinth Pipeworks S.A., 2005§).

Nickel.—Larco was the only producer of nickel in Europe that used domestic nickel ores. Larco had three main mining areas—Evia (open pit), with annual production of about 1.5 Mt of ore; Agios Ioannis (underground), with an annual production of about 700,000 t of ore; and Kastoria (open pit), with annual production of about 300,000 t. The Larymna metallurgical plant consisted of 4 rotary kilns, 5 electric arc furnaces, and 2 converters with a capacity of 50 t each of metal. Annual production of nickel met about 6% of European market demand (Larco G.M.M.S.A., 2005§).

Industrial Minerals

Anhydrite and Gypsum.—Lava Mining and Quarrying Co.'s anhydrite and gypsum quarry is located at Altsi, on the island of Crete. Quarrying was carried out using explosives, and the quarried material was fed to trucks by means of loaders, then transported to the crushing plant. The end product that came from the plant consisted of anhydrite and hydratous gypsum and was used in the production of cement (Lava Mining and Quarrying Co., 2005a§).

Bentonite.—S&B Industrial Minerals S.A. was the leading bentonite producer in Europe and the leading bentonite supplier worldwide. S&B remained focused on industrial markets for bentonite for foundry uses and also for use by the drilling industry. S&B's reserves were located on the island of Milos (S&B Industrial Minerals S.A., 2005a§).

Cement.—Heracles Cement S.A., which was a member of the Lafarge Group, had the following three cement plants: one in Volos, which was the largest-capacity cement plant in Europe (4.6 Mt/yr); one in Halkis Evia; and one in Milaki Evia. Total production capacity of the plants was 9.6 Mt/yr, which made Heracles the leading cement producer in Greece. Heracles was also active in the sale of ready-mix and aggregate products (Capital Link Inc., 2005§).

Magnesium Compounds.—Grecian Magnesite S.A. (GM) was one of the leading magnesite producers in the Western world and the leading exporter in the EU. GM's major deposits and production facilities were located in the Gerakini area of the Chalkidiki peninsula. After mining, the material was processed, beneficiated, and fed into rotary or shaft kilns. GM produced and marketed caustic calcined magnesite, deadburned magnesia, and raw magnesite. The annual capacity for the conversion to

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caustic or dead-burned magnesia was 200,000 t, about 97% of which was exported (Hellenic Center for Investment, 2005c§).

Perlite.—With a production of 650,000 t/yr, S&B was the leading producer of raw perlite worldwide and the leader in the European market for perlite used in building materials, cryogenics, formed products, and horticulture, and as filter aids. S&B mined perlite at Provatas, Thachylas, and Tsigrado on Milos Island (S&B Industrial Minerals S.A., 2005b§).

Pumice.—Lava Mining and Quarrying Co.'s pumice quarry was located on the island of Yali and was a product of volcanic action of the adjacent volcano at Nissiros. Quarrying of the deposit was performed without the use of explosives. Bulldozers fed a series of belt conveyors, screens, and crushers, which fed a graded product to stockpiles. Thereafter, a second series of belt conveyors fed ships of up to 30,000 t at a loading rate of 1,000 t per hour (Lava Mining and Quarrying Co., 2005b§).

Stone, Dimension.—In 2005, the Greek marble industry continued to play a leading role in the international dimension stone market. Marble production continued in almost all areas of the country for a variety of uses and in many colors (ash, black, brown, green, pink, red, and multicolored). The marble industry was active in the quarrying, processing, and sale of blocks and finished products.

Mineral Fuels and Other Sources of Energy

Coal.—Public Power Corporation (PPC) was Greece's major producer of lignite (brown coal), which was the predominant fuel in electricity generation in Greece. Most PPC lignite was produced from the Ptolemais-Amyntaion Basin; lesser amounts were produced from the Megalopolis Basin. Lignite reserves were estimated to be about 2,900 Mt. Because the country has no hard coal (black coal) reserves, it imports hard coal from, in descending order of amount imported, South Africa, Russia, Venezuela, and Colombia. Domestic production has been partly opened to private companies, but PPC was the leading producer, with the right to 63% of the reserves. Lignite accounted for about 65% of the raw material for the country's power generation (U.S. Energy Information Administration, 2005§).

Natural Gas and Petroleum.—With Greece's limited natural gas reserves and petroleum resources, production was negligible. Its Mediterranean location, however, makes it conveniently close to several important producing regions, such as the Caspian Sea area, the Middle East, and North Africa.

Greece's first privately owned powerplant, which is located in the Hellenic Petroleum industrial complex in Echedoros municipality, Thessaloniki, started operations in December 2005. The 390-megawatt (MW) plant produced electricity with the use of natural gas and was the first private investment in electricity production in Greece following the deregulation of the electricity and natural gas market. The 250 million euros ($310 million[2]) plant built by Energiaki Thessalonikis S.A. was considered to be one of the country's most important investments in the energy sector (Athens News Agency, 2005§).

Greece and Italy signed an agreement to construct an undersea natural gas pipeline between the two countries. The 212-kilometer (km) pipeline was to be built by Poseidon S.A. (a joint venture between Depa S.A. of Italy and Edison SpA of Italy). The pipeline will run from the northwest coast of Greece to the southeast coast of Italy and was expected to be completed by yearend 2009. Initially the pipeline will carry 2 billion cubic meters per year before rising to 8 billion cubic meters per year in 2012 (Schlumberger Ltd., 2005§).

Greece and Turkey inaugurated construction of a 300-km pipeline from Bursa, Turkey, to Komotini, Greece, that was expected to be operational by yearend 2006. The pipeline was expected to carry 11.5 billion cubic meters per year once connections were made to other pipelines as a part of the Southern Europe Gas Ring Project (Khaleej Times, 2005§).

Renewable Energy.—The Greek Government planned to create a steadily developing market for renewable energy sources that would boost entrepreneurship and regional development and attract new and foreign investments. The Government placed renewable energy sources, in particular wind energy, equally alongside electricity, natural gas, and liquid fuel in its energy program. It was estimated that in addition to the 490 MW of wind energy operating in 2005, another 1,500 MW to 2,000 MW of wind energy could be installed by 2010 (Hellenic Center for Investment, 2005a§).

Outlook

Greece is expected to remain a major supplier in the international market of industrial minerals. Mineral exploration activities in Greece will be intensified to secure additional high-quality reserves. Large investment programs could be planned to improve the existing installations and lower operating costs.

References Cited

Hellenic Competition Commission, 2005, Annual report on competition policy—Mergers: Hellenic Competition Commission, decision No. 275/IV/2005, December, p. 3.

Metal Bulletin, 2005, First zinc shipment completed at Stratoni: Metal Bulletin, no. 8924, December 19, p. 18.

Mining Journal, 2005, Exploration and development: Mining Journal, June 10, p. 9.

Internet References Cited

Alcan Inc., 2005 (March 15), Alcan completes sale of its controlling interest in Aluminium de Grèce, accessed May 4, 2006, at URL http://www.alcan.com/web/publishing.nsf.

Athens News Agency, 2005 (December 27), Greece's first privately owned power plant opens in Echedoros, accessed December 27, 2005, at URL http://www.ana.gr/anaweb/user/showplain?maindoc=3738055&maindocimg34359443&service=100.

Capital Link Inc., 2005 (September 29), Financial results, accessed November 29, 2005, at URL http://www.capitallink.com/newpress/company/54406090/36302.html.

Choose Media S.A., 2005, Minerals and metallurgy, accessed May 4, 2006, at URL http://www.choosegreece.com/menu.asp?id=4&item=11.

Corinth Pipeworks S.A., 2005, Line pipes, accessed May 4, 2006, at URL http://www.cpw.gr/Content.asp?catid=193&section=0.00.

European Goldfields Ltd., 2006 (February), Greece, accessed May 4, 2006, at URL http://www.egoldfields.com/goldfields.pdf.

[2]Where necessary values have been converted from European Union euros (€) to U.S. dollars (US$) at a rate of €1.00=US$1.24.

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Frontier Pacific Mining Corp., 2005 (December 17), Parama Hill gold project, accessed May 10, 2006, at URL http://www.frontierpacific.com/parama.php.
Hellenic Center for Investment, 2005a, Energy—Wind energy, accessed May 10, 2006, at URL http://www.elke.gr/default.asp.
Hellenic Center for Investment, 2005b, Mineral resources—Bauxite-alumina-aluminum, accessed May 10, 2006, at URL http://www.elke.gr/default.asp.
Hellenic Center for Investment, 2005c, Mineral resources—Magnesite, accessed May 10, 2006, at URL http://www.elke.gr/default.asp.
International Monetary Fund, 2006 (April), Greece, World Economic Outlook Database, accessed May 4, 2006, via URL http://www.imf.or/external/pubs/ft/weo/2006/01/data/dbcoutm.cfm.
Khaleej Times, 2005 (July 3), Turkish, Greek PM inaugurate construction of key gas pipeline, accessed July 6, 2005, at URL http://www.khaleejtimes.com/Displayarticle.asp.
Larco G.M.M.S.A., 2005, Larco operations, accessed May 4, 2006, at URL http://www.larco.gr/ hq_office.php.
Lava Mining and Quarrying Co., 2005a, Anhydrite and gypsum quarry, accessed May 4, 2006, at URL http://www.lava.gr/uk/text-4.html.
Lava Mining and Quarrying Co., 2005b, Pumice, accessed August 28, 2006, at URL http://www.lava.gr/uk/text-2.html.
S&B Industrial Minerals S.A., 2005a, Bentonite, accessed May 10, 2006, at URL http://www.s.andb.gr/en/main_in.html.
S&B Industrial Minerals S.A., 2005b, Perlite, accessed May 10, 2006, at URL http://www.s.andb.gr/en/main_in.html.
Schlumberger Ltd., 2005 (November 3), Greece, Italy to sign pipeline pact, accessed November 4, 2005, at URL http://realtimenews.slb.com/news/story.cfm.
U.S. Central Intelligence Agency, 2006a (April), Greece, World FactBook 2005, accessed May 5, 2006, at URL http://www.cia.gov/cia/publications/factbook/geos/gr.html.
U.S. Central Intelligence Agency, 2006b (April), Rank order—Exports/Imports, World FactBook 2005, accessed May 5, 2006, at URL http://www.cia.gov/cia/publications/factbook/rankorder/2078rank.html.
U.S. Energy Information Administration, 2005 (August), Greece, Country Analysis Brief, accessed May 4, 2006, at URL http://www.eia.doe.gov/emeu/cabs/greece.html.

Major Sources of Information

Institute of Geology and Mineral Exploration
70 Messoghion Street
11527 Athens, Greece
Ministry of Development
Directorate of Raw Materials Mineral Policy, Section A
80 Michalakopoulou Street
10192 Athens, Greece

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TABLE 1
GREECE: PRODUCTION OF MINERAL COMMODITIES

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005[e]
METALS						
Aluminum:						
Bauxite		1,931,497	2,468,865	2,442,312	2,444,000	3,315,300 [3]
Alumina, Al_2O_3		678,934	749,500	758,800	760,000 [e]	1,757,110
Metal:						
Primary		163,581	165,262	167,797	167,300	165,000
Secondary[e]		3,000	2,000	3,000	3,000	3,000
Iron and steel:						
Iron ore and concentrate, nickeliferous, Fe content[e]		575,000	600,000	600,000	575,000	575,000
Metal:						
Steel, crude		1,281,000	1,835,000	1,701,000	1,967,000	2,266,000 [3]
Ferroalloys, ferronickel, gross weight		88,755	97,761	95,376	96,000 [e]	95,000
Lead:						
Mine output, Pb content[e]		28,619 [3]	29,300	20,000	--	--
Metal, secondary	thousand metric tons	5	5	4	4 [e]	4
Manganese:[e]						
Ore, crude:						
Gross weight		90	100	100	100	100
Mn content		17	16	15	15	15
Concentrate:						
Gross weight		20	20	20	20	20
Mn content		9 [3]	15	15	15	15
Nickel:						
Ore:						
Gross weight[e]	thousand metric tons	2,600	2,800	2,700	2,700	2,800
Ni content of nickeliferous iron ore		20,830	22,670	21,410	21,700	22,000
Metal, Ni content of ferronickel		17,750	19,230	18,000 [e]	18,115	17,300 [3]
Silver, mine output, Ag content	kilograms	61,500	74,800	79,200	78,000 [e]	78,000
Zinc, mine output, Zn content by analysis		20,461	33,000	30,400	-- [e]	--
INDUSTRIAL MINERALS						
Abrasives, natural emery		8,000	8,000	8,000	8,000 [e]	8,000
Barite, concentrate[e]		100	100	100	100	100
Cement, hydraulic[e]	thousand metric tons	15,500	15,000	15,300	15,000	15,000
Clays:						
Bentonite:						
Crude		1,258,872	1,056,598	1,156,642	1,160,000 [e]	1,200,000
Processed		26,297	15,806	10,835	11,000 [e]	11,000
Kaolin:						
Crude		60,075	57,885	59,680	60,000 [e]	60,000
Processed[e]		300	300	300	300	300
Feldspar		126,400	124,100	102,800	103,000 [e]	105,000
Gypsum and anhydrite		808,890	850,786	731,785	735,000 [e]	735,000
Magnesite:						
Crude		483,296	558,057	549,049	550,000 [e]	500,000
Dead-burned		30,113	48,220	43,713	44,000 [e]	40,000
Caustic-calcined		113,355	105,234	98,357	100,000 [e]	100,000
Huntite, crude[e]		18,000	18,000	18,000	18,000	18,000
Nitrogen, N content of ammonia		56,500	66,100	123,300	131,500	130,000
Perlite:						
Crude		840,660	838,997	1,079,036	850,000 [e]	1,000,000
Screened		449,139	515,715	739,729	525,000 [e]	550,000
Pozzolan, Santorin earth		1,308,131	1,291,198	1,383,546	1,400,000 [e]	1,400,000
Pumice		802,000	810,000	893,000	890,000 [e]	800,000
Salt, all types		208,776	126,118	192,161	190,000 [e]	190,000
Silica[e]		125,000	125,000	130,000	130,000	130,000

See footnotes at end of table.

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TABLE 1--Continued
GREECE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005[e]
INDUSTRIAL MINERALS--Continued						
Sodium compounds:[e]						
Carbonate		750	750	750	750	750
Sulfate		5,000	5,000	5,000	5,000	5,000
Stone:[e]						
Dolomite		90,000	90,000	90,000	90,000	90,000
Marble	cubic meters	202,069 [3]	178,839 [3]	233,436 [3]	230,000	230,000
Flysch		80,000	80,000	75,000	75,000	75,000
Quartz, processed		6,500	6,500	6,000	6,000	6,000
Sulfur:[e]						
S content of pyrites		9,500	9,500	9,500	9,500	9,500
Byproduct, natural gas and petroleum		153,000	157,000	162,000	160,000	160,000
Talc and steatite		2,073	670	500	500 [e]	500
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Lignite	thousand metric tons	66,987	71,074	69,411	68,000 [e]	68,000
Lignite briquets[e]		34,000	35,000	32,000	32,000	32,000
Gas:[e]						
Manufactured, gasworks	million cubic meters	15	15	15	15	15
Natural	do.	36	36	36	30	30
Natural gas plant liquids	thousand 42-gallon barrels	350	350	350	140	140
Petroleum:						
Crude	do.	1,435	1,417	1,026	1,100 [e]	1,100
Refinery products:						
Liquefied petroleum gas	do.	8,839	8,909	8,932	8,900	8,900
Gasoline	do.	32,045	32,300	32,725	32,000	32,000
Naphtha	do.	7,489	8,075	7,905	8,000	8,000
Mineral jelly and wax[e]	do.	20	20	20	20	20
Jet fuel	do.	14,168	14,725	14,400	14,000	14,000
Kerosene	do.	93	101	116	115	115
Distillate fuel oil	do.	40,672	41,031	41,776	42,000	42,000
Refinery gas	do.	3,612	3,640	3,710	3,700	3,700
Lubricants	do.	1,190	1,225	1,260	1,200	1,200
Residual fuel oil	do.	50,000	49,280	49,617	50,000	50,000
Bitumen	do.	3,066	3,091	3,151	3,200	3,200
Petroleum coke	do.	886	908	880	900	900
Other	do.	707	770	756	750	750
Refinery fuel and losses	do.	7,434	7,455	7,490	7,500	7,500
Total	do.	170,221	171,530	172,738	172,000	172,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Zero.

[1]Table includes data available through April 2006.

[2]In addition to the commodities listed, other crude construction materials are produced, but no basis exists for estimation of production.

[3]Reported figure.

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TABLE 2
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, Al_2O_3		Aluminium de Grèce S.A. (AdG) (Mytilineos Holdings S.A., 53%)	Agios Nikolaos, Boeotia area	750
Aluminum		do.	do.	160
Asbestos		Hellenic Mineral Mining Co. S.A.	Mines at Zidani, near Kozani	100
Barite, $BaSO_4$		S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Milos Island	1
Bauxite		do.	Mines at Phocis, plants at Phocis and Itea	2,000
Do.		Eleusis Bauxites Mines, S.A.	Mines near Drama, Itea, and Phthiotis-Phocis	300
Do.		do.	Plants in Aghia Marina, Drama, and Itea	400
Do.		Delphi-Distomon S.A.; Hellenic Bauxites of Distomon S.A. (Aluminium de Grèce S.A.)	Beotia and Phokifda Mines, Delphi-Distomon area	500
Bentonite:				
Crude		Mediterranean Bentonite Co. S.A. (Industria Chemica Mineraria S.p.A., Italy)	Surface mines on Milos Island	20
Do.		Mykobar Mining Co. S.A. (Silver & Baryte Ores Mining Co. S.A.)	Mines at Adamas, Milos Island	300
Do.		do.	Plants at Adamas, Milos Island	200
Do.		S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Mines at Adamas, Milos Island	600
Processed		do.	Plant at Voudia Bay, Milos Island	400
Cement		Halkis Cement Co. S.A. (Lafarge Group)	Micro-Vathi plant, west-central Euboea Island	3,000
Do.		Halyps Cement S.A. (Ciments Français, France)	Paralia Aspropyrgos plant, Athens	800
Do.		Heracles Cement S.A. (Lafarge Group)	Plants at Halkis Evia, Milaki Evia, and Volos	9,600
Do.		Titan Cement Co. S.A.	Elefsis plant, Athens area	400
Do.		do.	Kamari plant, Boeotia	2,600
Do.		do.	Patras plant, northern Peloponnesus	1,900
Do.		do.	Salonica plant, Salonica	1,650
Ferroalloys, ferronickel, Ni content		Larco G.M.M. S.A.	Larymna metallurgical plant	25
Gold, Au in concentrate	kilograms	Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines, Olympias	5,000
Gypsum		Lava Mining and Quarrying Co. S.A.	Altsi, Crete Island	500
Do.		Titan Cement Co. S.A.	do.	280
Hunite/hydromagnesite		Microfine S.A.	Mines in Kozani Basin	100
Lead, mine, Pb in concentrate		Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines (Olympias, Stratoni) northeastern Chalkidike	30
Lignite		Public Power Corporation (Government)	Aliveri Mine, Euboea Island	420
Do.		do.	Megalopolis Mine, central Peloponnesus	7,000
Do.		do.	Ptolemais Mine, near Kozani	28,000
Magnesite, concentrate		Grecian Magnesite S.A. (GM)	Mine and plant at Gerakini and Kalives, Chalkidiki, northern Greece	200
Manganese, battery-grade MnO_2		Eleusis Bauxite Mines Mining, Industrial and Shipping S.A. [National Bank of Greece (OAE)]	Nevrokopi, Drama	10
Marble, slab	cubic meters	Aghia Marina Marble Ltd.	Pallini	100,000
Do.	do.	Chris G. Karantanis & Sons Co.	Korinthos	60,000
Natural gas	million cubic meters per day	Public Petroleum Corporation (Government)	Prinos offshore gasfield and oilfield, east of Thasos Island	125
Nickel, ore		Larco G.M.M. S.A.	Agios Ioannis Mine near Larymna	500
Do.		do.	Evia Mine near Larymna	1,500
Nitrogen, N content of ammonia		Phosphoric Fertilizers S.A.	Nea Karvall	150

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TABLE 2--Continued
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Perlite		S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Mines on Kos and Milos Islands; plant at Pireaus	650
Do.		Otavi Minen Hellas S.A. (Otavi Minen AG, Germany)	Milos Island	150
Do.		Bouras Co.	Kos Island	50
Petroleum, refined	42-gallon barrels per day	Hellenic Aspropyrgos Refinery S.A.	Aspropyrgos	95,000
Do.	do.	Motor Oil (Hellas) Corinth Refineries S.A.	Aghii Theodori, Corinth	140,000
Do.	do.	Petrola Hellas S.A.	Eleusis	100,000
Do.	do.	Thessaloniki Refining Co. A.E.	Thessaloniki	76,000
Pozzolan (Santorin earth)		Lava Mining and Quarrying Co. (Heracles General Cement Co. S.A.)	Xylokeratia, Milos Island	600
Do.		Titan Cement Co. S.A.	do.	300
Pumice		Lava Mining and Quarrying Co. (Heracles General Cement Co. S.A.)	Yali Island	100
Quartz		do.	Adamas, Milos Island	150
Steel, crude		Halyvourgia Thessalias S.A. (Manessis Bros. and Voyatzis S.A., 65%, and National Investment Bank for Industrial Development, 35%)	Steelworks at Volos	1,500
Do.		Sidenor Steel Products Manufacturing S.A.	Steelworks at Thessaalonili and Almyros	2,800
Do.		Halyvourgiki, Inc.	Steelworks at Eleusis	1,200
Do.		Hellenic Steel Co.	Steelworks at Thessaloniki	1,000
Do.		Corinth Pipeworks S.A. (CPW)	Steelworks at Thisvi	700
Zeolite		S&B Industrial Minerals, S.A. (Eliopoulos - Kyriakopoulos Group)	Mine at Pendalofos; plant at Ritsona	100
Zinc, mine, Zn in concentrate		Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines (Olympias and Stratoni), northeastern Chalkidike	30

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THE MINERAL INDUSTRY OF ICELAND

By Chin S. Kuo

Iceland's economy, which was heavily dependent on its export sectors, grew by 5.5% in 2005. The country exported aluminum, equipment and electronic machinery for fishing and fish processing, ferrosilicon alloys, marine products, and pharmaceuticals. The per capita gross domestic product based on purchasing power parity was high at $35,586. Inflation was moderate at 4% (International Monetary Fund, 2006§[1]). Iceland has abundant geothermal and hydroelectric power sources and few proven mineral resources. In recent years, the country has actively sought to expand its power-intensive industries, which include aluminum smelting and ferrosilicon production. The Ministry of Industry and Commerce seeks to improve the competitiveness of Icelandic industry by increasing its variety and productivity.

Solios Thermal Co. was awarded a contract for the Nordural Aluminum hf expansion project in Iceland. The project involved the expansion of the Nordural aluminum smelter to 212,000 metric tons per year (t/yr) from 90,000 t/yr by 2006 and to 260,000 t/yr by 2008. The contract was for the construction of two 60-metric-ton-capacity electric arc furnaces with the associated launders. Both furnaces would be commissioned by April 2006. The smelter, which has access to relatively cheap and plentiful power, started production in 1998 and was bought by Century Aluminum Co. of the United States in April 2004 (Solios Group, 2005).

Century Aluminum was looking at building a greenfield aluminum smelter in Iceland. Its wholly owned subsidiary Nordural signed a joint action plan with the local and Icelandic national Governments to evaluate the project in the vicinity of Helguvik, which is located 48 kilometers (km) from Reykjavik. The project would focus on developing an industrial site, securing power generation and transmission, satisfying environmental regulations, and meeting other regulatory and administrative requirements. Evaluation of the project was scheduled for completion no later than July 2006 (Century Aluminum Co., 2005).

During 2005, Alcoa Inc. of the United States was constructing a $2 billion 322,000-t/yr smelter in eastern Iceland. Aluminum production was expected to begin in 2007. Construction of a hydroelectric powerplant in connection with the smelter also began. Meanwhile, Alcan Aluminium Inc. of Canada was considering expanding its 176,000-t/yr smelter near Reykjavik (JPMorgan, 2005).

Iceland's hydroelectric power generation projects included the Burfell, with a capacity of 270 megawatts (MW); the Hrauneyjarfoss, 210 MW; and the Blanda and the Sigalda, 150 MW each. The country's road system connected most of the population centers in the coastal areas and consisted of 13,000 km of roads, of which 4,330 km was paved. The infrastructure was adequate to attract foreign investment in Icelandic industries (U.S. Department of State, 2005).

References Cited

Century Aluminum Co., 2005, Century Aluminum subsidiary signs joint action plan for new Icelandic smelter: Monterey, California, Century Aluminum Co. press release, November 8, 2 p.

JPMorgan, 2005, Century Aluminum reducing estimates given unexpected 3Q costs: New York, New York, JPMorgan note, September 26, 1 p.

Solios Group, 2005, First contract signed with Nordural (Iceland): Saint-Germain-en-Laye, France, Solios Group news release, June, 1 p.

U.S. Department of State, 2005, Iceland, Background Note: U.S. Department of State, May, p. 5.

Internet Reference Cited

International Monetary Fund, 2006 (April), Iceland, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Major Source of Information

Ministry of Industry and Commerce
Arnarhvoli
Reykjavik, Iceland 2000

[1]A reference that includes a section mark (§) is found in the Internet Reference Cited section.

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TABLE 1
ICELAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
Aluminum metal, primary[2]		245,135	285,394	286,022	284,700 [r]	273,318 [3]
Cement, hydraulic[4]		125,169	82,636	89,798	100,287 [r]	132,438 [3]
Diatomite		30,434	26,494	27,513	19,332 [r]	3,236 [3]
Ferrosilicon		111,948	120,624	117,171	119,389 [r]	114,844 [3]
Nitrogen, N content of ammonia		3,300	--	--	--	-- [3]
Pumice and related volcanic material:[e]						
Pumice		70,751 [3]	56,478 [3]	50,193 [3]	36,045 [r, 3]	105,454 [3]
Scoria		1,000	1,000	1,000	1,000	1,000
Salt[e]		4,500	4,500	4,500	4,600	4,600
Sand:[e]						
Basaltic	cubic meters	1,100	1,200	1,200	1,300	1,300
Calcareous, shell	do.	80,000	80,000	80,000	80,000	80,000
Sand and gravel	thousand cubic meters	4,000	4,200	4,200	4,200	4,300
Silica dust[5]		20,192 [3]	22,579 [3]	23,830 [3]	22,533 [r, 3]	22,992 [3]
Stone, crushed:[e]						
Basaltic		95,000	95,000	96,000	96,000	97,000
Rhyolite	cubic meters	17,000	18,000	18,000	19,000	19,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.
[1]Table includes data available through June 28, 2006.
[2]Ingot and rolling billet production.
[3]Reported figure.
[4]Sales.
[5]Byproduct of ferrosilicon.

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The Mineral Industry of Ireland

By Harold R. Newman

Ireland remained a major European Union (EU) producer of lead and zinc and an important producer of alumina and peat in 2004 (table 1). Zinc production was centered on Anglo American plc's Lisheen lead-zinc mine, Arcon International Resources plc's Galmoy lead-zinc mine, and New Boliden AB's Tara lead-zinc mine; these were three of Europe's most modern mines. Ireland was also one of the leading exporters of lead and zinc. The country's mineral-processing industry was small as was the demand for and consumption of mineral products (table 2).

Ireland has a land area of 70,280 square kilometers (km^2). It is bounded by Northern Ireland to the northeast, the Irish Sea to the east, and the Atlantic Ocean to the west. In 2005, the gross domestic product (GDP) based on purchasing power parity was $168 billion, and the per capita GDP based on purchasing power parity was $40,610, which was the second highest in the EU behind Luxembourg. The unemployment rate was estimated to be 4.3%, and the annual rate of inflation was about 2.2% (International Monetary Fund, 2006§[1]).

Ireland was a small, modern, trade-dependent economy. Industry accounted for about 80% of exports, 46% of the GDP, and 29% of the work force. Although exports were the primary engine for Ireland's growth, the economy also benefited from a rise in business investment, construction, and consumer spending (U.S. Central Intelligence Agency, 2006§).

Environmental issues included water pollution, especially of lakes, from fertilizer runoff from agricultural activities. Ireland's greenhouse gas emissions were still the highest per capita in the EU (U.S. Central Intelligence Agency, 2006§).

Ireland's geology includes several lithological units and tectonic features that are favorable for the occurrence of several types of mineral resources from base metals to industrial minerals. The main focus for exploration and development of Ireland's lead-zinc deposits was the Carboniferous rock of the Midlands region. The mineralization is hosted in strata-bound carbonate units.

The Department of Communications, Marine and Natural Resources provided technical assistance to exploration and mining companies. The Geological Survey of Ireland (GSI) was the national earth science agency and was responsible for providing geologic advice and information and for acquiring data for this purpose. The GSI has conducted many projects of interest to the mineral industry. The GSI produced a range of products that included databases, maps, and reports. It functions as a line division of the Department of Communications, Marine and Natural Resources.

Ireland asked the United Nations to extend its economic control over the continental shelf that borders its coastline beyond the usual 200 nautical miles. It has asked the Secretary General to the Commission on the Limits of the Continental Shelf for mineral and other rights over the Atlantic seabed abutting the Porcupine Abyssal Plain (Mining Journal, 2005a).

Aughinish Alumina plc's (a subsidiary of the Swiss-based Glencore Group) alumina refinery was situated on Aughinish Island on the south side of the Shannon estuary near Limerick City. Aughinish produced about 1.5 million metric tons per year (Mt/yr) of alumina by treating bauxite ore using the Bayer process. Most of the bauxite came from the Republic of Guinea, although some came from Australia and Brazil (Aughinish Alumina Ltd., 2005a§).

The Bayer process is very energy intensive and uses significant amounts of fuel oil and electricity to convert bauxite into alumina. Because energy is a significant cost, Aughinish has sought ways to improve efficiency. In December 2005, Aughinish started using natural gas in its new 150-megawatt combined heat and power (CHP) plant. CHP is the combined generation of usable heat and power in a single process. It is a highly efficient energy system for industry. It saves about 25% of the energy that would have been required to generate electricity in a conventional power station and heat in separate heat-only boilers (Aughinish Alumina Ltd., 2005b§).

Asarco Exploration Company Inc. was undertaking an extensive technical review of its ground holding in Ireland. The holding covered an area of 555 km^2 and was divided into five license blocks located in Counties Kildare, Laois, Limerick, Offaly, and Tipperary. These blocks host dolomitized Waulsortian Limestone Complex lithologies similar to those of the Gamoy and the Lisheen lead-zinc ore bodies. Asarco was seeking joint-venture partners for exploration and possible development of the blocks (Geological Survey of Ireland, 2005§).

Conroy Diamonds and Gold plc announced the discovery of 10 new gold targets in its latest sampling program. These more than doubled the number of gold targets in Conroy's exploration licenses, which covered 1,500 km^2 of the Longford-Down Massif. The individual anomalies were reported to be extensive and range up to 500 meters (m) in length (Conroy Diamonds and Gold plc, 2005§).

Galántas Gold Corp. announced that it would put its Omagh gold property into production. Bulk sampling produced ore with an average grade of 54.4 grams gold per metric ton of ore. Plant capacity would be 150 metric tons per day. The project was expected to provide certified Irish gold feedstock for Galántas's jewelry business. Galántas had full planning consent for an open pit mine and a conventional crush, grind, float-cyanide extraction plant. It did not intend to build a cyanide circuit at this stage, however (Galántas Gold Corp., 2005§).

Ireland was the leading producer of zinc in Europe and had three major producing mines within the Midland Orefield. These operations included the world-class ore bodies at Galmoy, Lisheen, and Navan.

[1]References that include a section mark (§) are found in the Internet References Cited section.

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Lundin Mining Corp. of Canada agreed to buy Arcon International Resources plc for $63 million and 5.6 million shares after receiving acceptances that represented 84% of Arcon's outstanding shares. Arcon owned the Galmoy Mine in County Kilkenny, which produced 69,000 metric tons (t) of zinc and 15,000 t of lead in 2004. Lundin Mining already owned the Storliden and the Zingruvan Mines in Sweden (Mining Journal, 2005b).

Minco plc continued a joint-venture diamond drilling project with Falconbridge Ltd. on the Pallas Green zinc-lead project in County Limerick. The Pallas Green Alteration Trend lies 45 km west of the Lisheen Mine and is located in the southern part of the Midland Orefield. The geology of the Pallas Green license block was dominated by the Pallas Green Alteration Trend, which is a zone of structural and hydrothermal complexity that extends for more than 20 kilometers between Castlegarde and Limerick and is believed to be analogous to the Rathdowney Trend with which both the Gamoy and the Lisheen deposits are associated. All the modern Irish carbonate-hosted zinc mines discovered since 1961 were located within the Midland Orefield (London Stock Exchange, 2005§).

New Boliden AB reported that its Tara zinc-lead mine was back in full production following repairs to an electric motor in one of the grinding mills. The breakdown caused New Boliden to declare force majeure at the mine. The motor's breakdown caused the operation's zinc and lead production to fall by about 40% (Mining Engineering, 2005).

Historically, Ireland has not been a very successful location for natural gas and petroleum exploration. Activity has been hindered by the lack of success and by high cost.

Ramco Energy plc reported significant losses following water ingress in its Seven Hills field natural gas wells off the southern coast of Ireland. The intrusion brought production to a halt. The company was reported to be seeking a buyer for its 86.5% interest in the natural gas field (Offshore, 2005).

Outlook

GSI will continue to be responsible for the development of minerals information and for the technical management of the state mineral licensing and leasing system. Ireland will remain a major EU producer of zinc and an important producer of alumina and lead. Exploration activity for additional new mineral resources, with the main emphasis on gold, lead, and zinc, will continue to increase.

References Cited

Mining Engineering, 2005, News briefs: Mining Engineering, v. 57, no. 8, August, p. 19.

Mining Journal, 2005a, Ireland claims seabed control: Mining Journal, September 9, p. 5.

Mining Journal, 2005b, Lundin Mining to acquire Arcon: Mining Journal, March 4, p. 11.

Offshore, 2005, Ramco perseveres off Ireland: Offshore, v. 65, no. 9, September, p. 15.

Internet References Cited

Aughinish Alumina Ltd., 2005a, Introduction, accessed May 31, 2006, at URL http://www.aughinish.com/introduction.htm.

Aughinish Alumina Ltd., 2005b, What is CHP? accessed May 31, 2006, at URL http://www.aughinish.com/CHP/CHP_Introduction.htm.

Conroy Diamonds and Gold plc, 2005 (April 4), Conroy identifies ten new gold targets in latest sampling programme, accessed May 31, 2006, at URL http://www.conroydiamondsandgold.com/news_4Apr-05.htm.

Galántas Gold Corp., 2005 (February 7), Galántas to put Omagh gold property into production, accessed May 31, 2006, at URL http://wwew.galantas.com/corporate/s/newsrelease290905.html.

Geological Survey of Ireland, 2005 (May), Industry news, accessed August 18, 2005, at URL http://www.minex.ie/Industry+News+May+2005.htm.

International Monetary Fund, 2006 (April), Ireland, World Economic Outlook Database, accessed May 4, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcoutm.cfm.

London Stock Exchange, 2005 (August 8), Minco plc, accessed August 8, 2005, at URL http://www.londonstockexchange.com/LSECWS/IFSPages/MarketNews.html.

U.S. Central Intelligence Agency, 2006 (August 22), Ireland, World Factbook 2006, accessed September 7, 2006, at URL http://www.cia.gov/cia/publications/factbook.html.

Major Sources of Information

Department of Communication, Marine and Natural Resources
29-31 Adelaid Road
Dublin 2, Ireland

Geological Survey of Ireland
Beggars Bush, Haddington Rd.
Dublin 4, Ireland

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TABLE I
IRELAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
METALS						
Alumina[e]		1,400	1,200	1,200	1,400 [r]	1,500
Iron and steel, steel, crude		110	--	--	--	--
Lead:						
Mine output, Pb content	metric tons	44,518	32,486	50,339	65,915	63,810 [2]
Metal, refined, secondary[e]	do.	9,800	6,600	6,600	19,600 [r]	19,992 [2]
Silver, mine output, Ag content	kilograms	19,300	5,000	6,500 [r]	6,300 [r]	6,000
Zinc, mine output, Zn content	metric tons	225,135	252,700	419,041	444,127	428,596 [2]
INDUSTRIAL MINERALS[3]						
Cement, hydraulic[e]		3,450 [r]	3,320 [r]	3,830 [r]	4,000 [r]	4,000
Gypsum[e]		500	500	500	500	500
Lime[e]	metric tons	100,000	300,000	300,000	300,000	300,000
Nitrogen, N content of ammonia		443	300	--	--	--
Sand and gravel[e, 4]		12,000	12,000	12,000	12,000	12,000
Stone and other quarry products:[e]						
Limestone	million metric tons	1	1	1	1	1
Other[5]	metric tons	36,000	36,000	36,000	36,000	36,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural, marketed[e]	million cubic meters	2,500	2,500	2,500	2,500	2,500
Peat:[6]						
For horticultural use		300	350	451	400 [e]	450
For fuel use, milled peat[7]		4,599	4,138	2,739	5,200 [e]	5,000
Total		4,899	4,488	3,190	5,600 [e]	5,450
Briquets		248	268	269	284	275
Petroleum refinery products:[8]						
Liquefied petroleum gas	thousand 42-gallon barrels	657 [r]	694 [r]	657 [r]	500 [e]	500 [e]
Naphtha[e]	do.	900	900	900	900	900
Gasoline, motor	do.	5,329 [r]	5,585 [r]	5,402 [r]	4,500 [e]	4,500 [e]
Distillate fuel oil	do.	8,176 [r]	7,191 [r]	7,373 [r]	8,000 [e]	8,000 [e]
Residual fuel oil	do.	7,410 [r]	6,899 [r]	6,497 [r]	7,000 [e]	7,000 [e]
Refinery fuel and losses	do.	767 [r]	912 [r]	913 [r]	75 [e]	75 [e]
Total	do.	23,239 [r]	22,181 [r]	21,742 [r]	21,000 [e]	21,000 [e]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through September 2006.

[2]Reported figure.

[3]Ireland also produces significant quantities of synthetic diamond and is the major supplier to the United States. Output, however, is not quantitatively reported, and general information is inadequate to make reliable estimates of output.

[4]Excludes output by local authorities and road contractors.

[5]Includes clays for cement production, fire clay, granite, marble, rock sand, silica rock, and slate.

[6]Includes production by farmers and by the Bord Na Mona (Government Peat Board).

[7]Includes milled peat used for briquet production.

[8]From imported crude oil.

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TABLE 2
IRELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facility	Annual capacity
Alumina		Aughinish Alumina plc (Glencore International AG)	Aughinish Island, County Limerick	1,500
Cement		Irish Cement Ltd.	Plants in Limerick and Platin	2,000
Lead-zinc, concentrate		Anglo American plc	Lisheen Mine, County Kilkenny	160
Do.		Arcon International Resources plc (Lundin Mining Corp., 84%)	Galmoy Mine, County Kilkenny	135
Do.		New Boliden AB	Tara Mine, Navan, County Meath	215
Natural gas	million cubic feet	Marathon Oil Corp.	Kinsale Head Field, Celtic Sea	75,000
Do.	do.	Ramco Energy plc.	Seven Hills field	50,000
Nitrogen, N content of ammonia		Irish Fertilizer Industries	Plant at Marino Point	450
Peat		Bord Na Mona (Government Peat Board)	Production mainly in the Midlands	4,200
Petroleum, refined	42-gallon barrels per day	Irish National Petroleum Corp. Ltd. (Tosco Corp., 100%)	Whitegate, near Cork	75,000
Steel		Irish Ispat (Ispat International NV)	Haulbowline, near Cork (closed)	500

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THE MINERAL INDUSTRY OF ITALY

By Harold R. Newman

Although Italy has been a significant processor and consumer of imported raw materials, the country is relatively poor in mineral resources. Deposits of coal, iron, metallic minerals, and petroleum are not substantial. In 2005, Italy continued to be a leading producer of cement, crude steel, dimension stone, feldspar, marble, and pumice and to supply a significant portion of its own needs for some minerals. Industrial mineral production, including construction materials, was an important sector of the economy. Italy was a significant processor of imported raw materials and a consumer and exporter of metal and mineral semimanufactured and finished products. Mining contributed only a small portion of the gross domestic product (GDP). Italy was almost entirely dependent on imports of natural gas and petroleum to meet its energy needs.

The country is a peninsula in southern Europe that is surrounded on the west by the Tyrrhenian Sea and on the east by the Adriatic Sea. It is bounded by France, Switzerland, Austria, and Slovenia to the north. Italy includes several islands, the largest of which are Sicily, 25,708 square kilometers (km^2), and Sardinia, 24,090 km^2, and has a surface area of 301,000 km^2. In 2005, the GDP based on purchasing power parity was $1.7 trillion. The GDP per capita based on purchasing power parity was $28,760. The annual change in inflation was 2.3% and the unemployment rate was 8.1% (International Monetary Fund, 2006§[1]).

Government Policies and Programs

Italy was one of the 11 founding members of the European Economic and Monetary Union; it was the world's seventh ranked economy and the fourth ranked economy in Europe in 2005. The Government continued to play a role in the economy through regulation of ownership of large industrial and financial companies; privatization and regulatory reform in accordance with European Union (EU) directives, however, had reduced that presence.

Environmental Issues

Environmental issues in Italy were focused on three main problem areas—air pollution from industrial emissions, such as sulfur dioxide; water pollution of coastal and inland rivers from industrial and agricultural effluents; and weak environmental laws. Possible natural hazards included landslides, avalanches, volcanic eruptions, and land subsidence in Venice (U.S. Central Intelligence Agency, 2006§).

Production

Mining of such metallic ores as lead, silver, and zinc was not regionally significant. Gold was produced by one company, Sargold Resource Corp., near Cagliaria, Sardinia.

Production of industrial minerals, which included construction materials, was estimated to be the most important sector of the mineral industry; the overall estimated output remained about the same as that of 2004. Domestic production of natural gas and crude petroleum also remained about the same as that of 2004.

Private and public companies own facilities for the mining and processing of minerals and mineral products (table 2). Some enterprises were under state control for such economic reasons as to maintain employment.

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Euroallumina S.p.A. was an international joint venture between Comalco Ltd. (56.2%) and Glencore International AG (43.8%) and operated a plant in the Porto Vesme Industrial Area in southwestern Sardinia; the plant produced metallurgical-grade alumina and aluminum hydrate for joint-venture participants. Part of the alumina produced (about 25%) was used at Alcoa Italia S.p.A.'s Porto Vesme smelter, for which Euralumina was the sole supplier. The rest of the production was sold on the international market (Comalco Ltd., 2005§).

Vendani Carlo Metalli S.p.A. held negotiations with Novelelis S.p.A. to buy Novelis's cast alloy smelter in Borgofranco d'Ivrea. The talks appeared to be nearing the end of a long-running process to sell the smelter that was no longer considered a core asset of the Alcan Inc. spinoff. Verdani produced about 170,000 metric tons per year (t/yr) of primary and secondary aluminum at two plants in Pavia (Metal Bulletin, 2005).

Copper.—Società Metalli Italia S.p.A., which was the leading producer of electrorefined copper in Italy, accounted for more than one-half of Italy's refined copper output. Copper mines in Italy were not in production in 2005, and imports of ore were small. The production was mainly from scrap.

Gold.—Medoro Resources Ltd. announced that it had sold all its Italian assets to Sargold Resource Corp. The assets included Gold Mines of Sardinia Pty Ltd.'s (GMS) mining operations at Furtei, the undeveloped gold property at Osilo, and the Monte Ollasteddu gold project. GMS stated that it would continue to evaluate properties in the natural gas and petroleum sectors, with emphasis in South America (Medoro Resources Ltd., 2005§).

Iron and Steel.—The Riva Group consisted of several companies that operated in the iron and steel production sector. The Riva Acciaio S.p.A. group of seven plants included the Lesegno works, which had a 95-metric-ton (t) electric furnace, a ladle furnace, a 6-strand continuous casting machine, and a rolling mill for rounds and billets; the Verona works, which had two 85-t electric furnaces, one ladle furnace, two 6-strand continuous casting machines, and a rolling mill; the Caronno Pertusella works, which had an 80-t electric furnace, a ladle furnace, and a 6-strand continuous casting machine; the Sellero

[1]References that include a section mark (§) are found in the Internet References Cited section.

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works, which had two pusher reheat furnaces and a rolling mill for beals; the Cerveno works, which had a pusher reheat furnace and a rolling mill; the Malegno works, which had three drawing lines for round, ground, and drawn bars; and the Annone Brianza works, which had 10 rolling mills for wire rod and 8 welding machines for mesh. Riva, which was the leader in the steel sector in Italy, ranked 4th in Europe and 11th in the world. The main production of the group in 2005 was 17.5 million metric tons (Mt) of raw steel, 9.1 Mt of black coil, 4.2 Mt of wire rod, 2.2 Mt of concrete-reinforcing steel, 1.2 Mt of quatro plates, 1 Mt of rolled bars and billets, 0.7 Mt of welded pipe, and 0.4 Mt of hollow sections (Riva Group, 2005§).

Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame) was the European leader in the production of commercial rolled sections used in building and of iron for construction of civil and industrial works; it was the main producer of special bars for earth-moving machines and for shipbuilding. AFV-Beltrame was part of the Beltrame Group of eight plants that were located in Belgium, France, Italy, and Luxembourg (Acciaierie e Ferriere Vicentine Beltrame S.p.A., 2005§).

Lucchini S.p.A. had a fully integrated plant at Piombino that produced both finished long products and semifinished flat and long products. Lucchini was the leading producer of high-quality wire rod and hot-rolled long products and was one of a few European manufacturers able to produce high-quality seamless rails of 108 meters (m) in length. In 2005, it produced about 2.4 Mt of crude steel and was one of the European leaders in the production of special steel long products (Lucchini S.p.A., 2005b§).

Lucchini and the Severstal Group of Russia announced the signing of an agreement for the Russian steel concern to acquire a 62% stake in Lucchini. The transaction would cost €450 million ($576 million[2]), which Severstal would pay from its existing cash fund. The deal was expected to benefit both parties substantially. Severstal would be able to leverage off an established European platform and a complementary range of engineering steel long products, and Lucchini would preserve its integrity and benefit from a partnership with a world-class, financially strong steelmaker. Lucchini was reported to have been losing about one-quarter of a billion dollars per year and was carrying a debt of about $2.4 billion (Lucchini S.p.A., 2005a§).

Lead and Zinc.—Italy imported most of its requirements for lead and zinc concentrates. Within Italy, a minor amount of lead and zinc concentrate production came from mines on Sardinia Island.

Glencore International AG announced that it was considering closing the zinc imperial smelting furnace (ISF) at its Porto Vesme lead and zinc plant. The rest of the plant, which included an electrolytic zinc refinery, a Kivcet lead smelter, and a lead refiner, would not be affected. The ISF operation had been closed in 2003 owing to high electricity costs and then reopened in 2004 when the Government agreed to provide a subsidy to help with electricity costs. The European Commission (EC) deemed that subsidy illegal. Another shutdown was likely when the stockpile of concentrates is used up (American Metal Market, 2005§).

Industrial Minerals

Barite.—Societá Mineraria Baritina S.p.A. (SMB) mined barite from two locations in northern Italy. SMB's production capacity was 20,000 t/yr, which was mainly used in making paint and drilling-grade material. SMB's main markets were Italy and Spain.

Bentonite.—Laviosa Chimica Mineraria S.p.A's activities included two facilities at Livorno and one on Sardinia Island. The bentonite operation on Sardinia served the cat litter market. Bentonite was mined, processed, packaged, and delivered directly from Sardinia Island (Laviosa Chimica Mineraria S.p.A., 2005§).

Cement.—Buzzi Unicem S.p.A. was active in the production and distribution of cement, ready-mix concrete, and related products. Buzzi Unicem operated 12 plants, 1 grinding facility, and 4 sea terminals located throughout the country; the company had a production capacity of about 9.5 Mt/yr of portland cement and an estimated market share of 17% (Buzzi Unicem S.p.A., 2005§).

Italcementi Fabbriche Riunite Cemento S.p.A., which was part of the Italcementi Group, announced the completion of work on the that tunnel links the raw materials quarry with the Nuova Calusco cement plant. The tunnel, which runs underground for its entire length, was nearly 10 km long, was fully automated, and conveyed 600 metric tons per hour of material. The tunnel was part of a revamping of the works at an investment cost of €150 million ($192 million); the effort was focused on relocation of facilities and included the replacement of four old kilns with a new one (Italcementi Group, 2005b§).

Italcementi was making a direct move into the sea transport of loose cement. The ship *Turbocem* was a self-unloading cement carrier with a 5,500-t net load capacity. The investment to construct the vessel totaled about €6.5 million ($10.8 million) and represented Italcementi's first step in the strategy to become a major presence in the sea transport of loose cement (Italcementi Group, 2005a§).

Gypsum.—Fassa S.r.l.'s gypsum processing plant continued to burn and process gypsum extracted from a nearby quarry. The plant was completely automatic from the discharge of raw gypsum to the bagging of the finished product.

Lime.—The Italian lime industry had a quicklime production of about 1,8 Mt/yr. Unicalce S.p.A., which had a capacity of about 500,000 t/yr, was the leading producer of quicklime. Most of the lime production was concentrated in Lombardy (Paginegialle Italy, 2005§).

Potash.—Production of potash had been suspended since 2002. The main reasons continued to be the shortage of ground water and the inability to remove waste material and mine water owing to environmental and ecological concerns. The underground mines in Sicily that had been operating at Pasquasia, Racalmuto, and Realmonte remained on care and maintenance status.

Pumice and Pumicite.—Pumex S.p.A. was one of the world's major producers of pumice powders. The mineral was

[2]Where necessary, values have been converted from European Union euros (€) to U.S. dollars ($) at the rate of €1.00=$1.28.

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extracted and processed on the island of Lipari, which is the largest of the Aeolian Islands located off the northeastern coast of Sicily. Pumex, which had a capacity of about 600,000 t/yr, was Italy's leading pumice producer. The company quarried the Mount Pelato deposit and supplied lightweight aggregates for concrete, grout, and mortar for the construction industry. These products were exported worldwide (Pumex S.p.A., 2005§).

Stone, Dimension.—Marble occurs in many localities from the Italian Alps to Sicily and was quarried at hundreds of operations. The most important geographic area for producing white marble is in the Apuan Alps in Tuscany, particularly near the town of Carrara. Lombardy, the Po Valley, Puglia, and Verona-Vincenza on the mainland and the island of Sicily are important colored-marble-producing areas. About one-half of the production was in block form. Other major marble-producing areas included the Valle di Susa, which is located near Benevento and Turin.

Mineral Fuels and Other Sources of Energy

The Government has expressed a commitment to improve conditions for companies looking to drill and develop natural gas and petroleum fields in the country. The reorganization of the energy sector has been set to enable the relaunch of the Italian upstream sector so that it can play a growing role in Europe's natural gas and petroleum industries, especially at a time when the energy markets of the EU were in the process of being deregulated with a view toward future integration (Offshore Engineer, 2005).

Coal.—Coalcorp Mining Inc., formerly Adobe Ventures Inc., entered into an agreement with Sardegna Energy Ltd. (SEL) to upgrade and operate the Carbosulcis Mine in Sardinia and to develop and operate an integrated gasification powerplant. SEL provided the Regional Administration of Sardegna (RAS) with a feasibility study for establishing the ability to use gasification technology to convert the Corbosulcis coal into power. The Carbosulcis project consisted of an integrated concession that covered a coal mine and a proposed 450-megawatt (MW) powerplant situated in the industrial zone of Porto Vesme. Although RAS publicly supported the Carbosulcis acquisition and began the process of awarding the concession for the Carbosulcis coal mine, Coalcorp decided to write off costs related to the Carbosulcis acquisition and not proceed with the project because of continuing political and administrative barriers and delays (Resource World Magazine, 2005§).

Geothermal Energy.—Geothermal energy continued to be produced in the Larderello, the Monte Amiata, and the Travale areas in Tuscany. Exploration that used various geologic techniques was being actively pursued in these areas, and research for power stations that exploit geothermal energy was continuing.

Natural Gas and Petroleum.—Italy was less than 20% self-sufficient in energy. Italy's natural gas reserves were estimated to be 226.5 billion cubic meters, and its petroleum reserves were estimated to be 622 million barrels. Italy imported 84% of its natural gas requirements and 93% of its petroleum requirements for domestic consumption. The leading sources of imports of natural gas were Algeria (38%), Russia (32%), and the Netherlands (14%). The leading sources of imports of petroleum were Libya (25%), the former Soviet Union (23%), and Saudi Arabia (13%). Italy was the fourth ranked consumer of energy in Europe (U.S. Energy Information Administration, 2006§).

Edison S.p.A. of Italy and Depa SA of Greece signed an agreement to build an 800-km natural gas pipeline between the two countries at a cost of €950 million ($1.2 billion). The project was scheduled to be completed by 2010 when 60% of Italy's electric energy would be produced by gas-powered generating stations. The pipeline would allow Italy to import from 8 billion to 10 billion cubic meters per year from the Caspian Sea and the Middle East (Alexander's Gas & Oil Connections, 2005§).

Azienda Energetical Municipale (AEM) and Electricité de France (EDF) received EC approval to take control of Edison in a deal that valued the power group at $9.9 billion. Edison was Italy's second ranked power group after Enel S.p.A. (EN). Under the multistage deal, AEM, EDF, and other partners would buy the holding company Italenergia S.p.A., which owned 62% of Edison. They would then be forced by Italian law to launch a full takeover bid for Edison (Reuters, 2005§).

Nuclear Energy.—EDF and EN signed a memorandum of understanding for the joint development of the new-generation European Pressurized Reactor (EPR) program. The EPR is a third generation fission pressurized water reactor (PWR) design. It was designed and developed mainly by Electricité de France, Framatome NP, and Siemens AG. The main design objectives were increased safety, enhanced economic competitiveness, and improvements to previous PWR designs. The reactor would have an electrical power output of 1,600 MW and could use 5% enriched uranium oxide or a mixed uranium plutonium oxide fuel (Enel S.p.A., 2005§).

Eni S.p.A. purchased 50% of Siciliana Gas S.p.A. from Sicily's industrial development agency, which raised its holding to 100%. Siciliana Gas operated 2,600 km of pipelines on Sicily and supplied 190 million cubic meters per year of gas in 2005. The cost of the purchase was $117.6 million (Petroleum Economist, 2005).

Outlook

Mining of metallic ores is expected to cease altogether owing to depletion of reserves. The metals-processing industry, which is based primarily on imported raw materials, is expected to continue to play an important role in Italy's economy. Italy is expected to remain a leading producer of crude steel and a significant producer of secondary aluminum in the EU.

The industrial minerals quarrying industry and preparation plants are expected to remain significant, especially in the production of barite, cement, clays, fluorspar, marble, and talc. Italy is expected to continue to be a leading producer of feldspar, feldspathic minerals, and pumice.

Although production has been relatively stagnant during the past 5 years, domestic outputs of natural gas, crude petroleum, and petroleum refinery derivatives are expected to grow. Italy will continue to depend on imported coal, gas, and petroleum for most of its energy needs. Because of the energy shortage in the country, nuclear power will become more viable.

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References Cited

Metal Bulletin, 2005,Vedani Carlo interested in Novelis secondary Al smelter in Italy: Metal Bulletin, no. 8917, October 31, p. 28.

Offshore Engineer, 2005, Italy moves to reform energy sector: Offshore Engineer, v. 30, no. 4. April, p. 7.

Petroleum Economist, 2005, Italy: Petroleum Economist, v. 73, no. 3, March, p. 40.

Internet References Cited

Acciaierie e Ferriere Vincentine Beltrame S.p.A., 2005, The Group, accessed August 17, 2006, at URL http://gruppobeltreme.com/eng/gruppo.php.

Alexander's Gas and Oil Connections, 2005 (November 24), Italy and Greece sign deal to build gas pipeline, accessed December 22, 2005, at URL http://www.gasandoil.com/goc/company/cne54791.htm.

American Metal Market, 2005, Glencorp considers closing zinc smelter at Porto Vesme, accessed August 17, 2006, at URL http://www.findarticles.com/p/articles/mi_m3MKT/is_4-3_113?ai_n9506203.

Buzzi Unicem S.p.A., 2005, Locations, accessed August 21, 2006, at URL http://www.buziunicem.it/online/lang.en_EN/BuzziUnicem/Home/Chisiamo/Dovesiamo/articolo543.html.

Comalco Ltd., 2005, Eurallumina S.p.A., accessed August 16, 2006, at URL http://www.comalco.com/freedom.asp?=208.

Enel S.p.A., 2005 (May 30), Cooperation agreement between Enel and EDF signed, accessed August 15, 2006, at URL Enel.it/azienda_en/sala_stampa/comunicatiarticolo.asp.

International Monetary Fund, 2006 (April), Italy, World Economic Outlook Database, accessed August 14, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcoutm.cfm.

Italcementi Group, 2005a (April 28), Italcementi is taking its first step into shipping business, accessed August 21, 2006, at URL http://www.italcemtigroup.com/newsite/notizia_turbocem.htm.

Italcementi Group, 2005b (May 31), Work completed on the tunnel linking quarries with the Calusco cement plant, accessed August 21, 2006, at URL http://www.italcementigroup.com/newsite/notizia_tunnelCalusco.htm.

Laviosa Chimica Mineraria S.p.A., 2005, Company profile, accessed August 21, 2006, at URL http://www.laviosa.it/eng/catalogo.asp.

Lucchini S.p.A., 2005a (September 2), Definitive agreement signed for the acquisition by Severstal Group of a 62% stake in Lucchini S.p.A., accessed August 17, 2006, at URL http://www.lucchini.it/news/news.asp.

Lucchini S.p.A., 2005b, Hot-rolled products, accessed December 28, 2006, URL http://www.lucchini.it/products/baseplates.asp.

Medoro Resources Ltd., 2005 (August 11), Medoro Resources announces completing agreement with Sargold, accessed August 15, 2006, at URL http://www.micro.newswire.ca/release.cgi.

Paginegialle Italy, 2005, Unicale S.p.A., accessed March 19, 2007, at URL http://www.paginegialle.it/pg/cgi/pgms.cgi.

Pumex S.p.A., 2005, About us, accessed August 21, 2006, at URL http://www.pumex.it/intro.swf.

Resource World Magazine, 2005, Carbosulcis acquisition and proposed merger, accessed January 8, 2007, at URL http://www.resourceworldmag.com/news.cfm.

Reuters, 2005 (August 12), EC approves joint takeover of Italy's Edison, accessed August 12, 2005, at URL http://www.today.reuters.com/PrinterFriendlyPopup.aspx.

Riva Group, 2005, Group outline, accessed August 15, 2006, at URL http://www.rivagroup.com/ivagroup/RivaGroupSitoWebEng.nsf.

U.S. Central Intelligence Agency, 2006 (August 8), Italy, World Factbook, accessed August 14, 2006, at URL http://www.cia.gov/cia/publications/factbook/geos/it.html.

U.S. Energy Information Administration, 2006 (May), Italy, Country Analysis Brief, accessed August 14, 2006, at URL http://www.eia.doe.gov/emeu/cabs/Italy/Full.html.

Major Sources of Information

Associazione Mineraria Italiana
Via delle Madonne, 20
00197 Rome, Italy

Ministero dell Industria del Commercio e dell Artigianato
Direzione Generale delle Minire
Via Molise, 2
00184 Rome, Italy

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TABLE 1
ITALY: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Alumina, calcined basis		950,000	925,000	975,000	950,000	950,000
Bauxite	thousand metric tons	300	300	300	300	300
Metal:						
Primary		187,400 [3]	190,000	191,000	195,400 [3]	192,900 [3]
Secondary		574,900 [3]	590,000	594,000	619,000 [3]	654,100 [3]
Total		762,300 [3]	780,000	785,000	814,400 [3]	847,000 [3]
Antimony oxides, gross weight[4]		600	500	500	500	500
Bismuth metal		5	5	5	5	5
Cadmium metal, smelter		313	390	22 [3]	--	--
Copper, metal, refined, all kinds		35,500	32,400	26,700 [3]	33,600	32,200
Gold, mine output, Au content	kilograms	503	600	500	100	100
Iron and steel, metal:						
Pig iron	thousand metric tons	10,650	9,736 [3]	10,148 [r, 3]	10,604 [r, 3]	10,000
Ferroalloys, electric furnace:						
Ferromanganese		40,000	40,000	40,000	40,000	40,000
Ferrosilicon		12,000	12,000	12,000	12,000	12,000
Silicomanganese		80,000	80,000	80,000	80,000	80,000
Silicon metal		5,978	6,000	6,000	-- [r]	--
Other		10,000	10,000	10,000	10,000	10,000
Total		147,978	148,000	148,000	142,000 [r]	142,000
Steel, crude	thousand metric tons	26,483	25,930 [3]	26,832 [r, 3]	28,477 [r, 3]	28,913 [3]
Lead:						
Mine output, Pb content		1,000	500	500	500	500
Metal, refined:						
Primary		82,000	41,000	16,000	40,000 [3]	49,500 [3]
Secondary		121,000	152,000	198,000	162,000 [3]	161,500 [3]
Total		203,000	193,000	214,000 [3]	202,000 [3]	211,000 [3]
Manganese, mine output, Mn content		1,000	500	500	500	500
Silver, mine output, Ag content	kilograms	3,500	3,500	3,000	3,000	3,000
Zinc, metal, primary		177,800	175,800 [3]	123,100 [3]	118,000	121,000 [3]
INDUSTRIAL MINERALS						
Barite		10,809 [r, 3]	10,215 [r, 3]	12,214 [r, 3]	12,000 [r]	12,000
Bromine		300	300	300	300	300
Cement, hydraulic	thousand metric tons	39,885	40,000	40,000	40,000	38,000
Clays, crude:						
Bentonite	do.	579 [3]	463 [r, 3]	474 [r, 3]	500 [r]	500
Refractory excluding kaolinitic earth	do.	700	700	700	700	700
Fuller's earth	do.	20	24 [r, 3]	5 [r]	5 [r]	5
Kaolin	do.	295 [r, 3]	175 [r, 3]	225 [r, 3]	250 [r]	250
Kaolinitic earth	do.	10	10	10	10	10
Diatomite		25,000	25,000	25,000	25,000	25,000
Feldspar	thousand metric tons	3,240 [r, 3]	3,159 [r, 3]	2,972 [r, 3]	3,000 [r]	3,000
Fluorspar:						
Acid-grade		30,000	30,000	30,000	30,000	30,000
Metallurgical-grade		15,000	15,000	15,000	15,000	15,000
Total		45,000	45,000	45,000	45,000	45,000
Gypsum	thousand metric tons	1,559 [r, 3]	1,531 [r, 3]	1,784 [r, 3]	1,600 [r]	1,600
Lime, hydrated, hydraulic and quicklime	do.	2,500	2,500	2,200 [r]	2,200	2,200
Nitrogen, N content of ammonia	do.	434	391 [3]	475 [r, 3]	532 [3]	525 [3]
Perlite		60,000	60,000	60,000	60,000	60,000
Pigments, mineral, iron oxides, natural		500	500	500	500	500
Pumice and related materials:						
Pumice and pumiceous lapilli	thousand metric tons	600	600	600	600	600
Pozzolan	do.	4,000	4,000	4,000	4,000	4,000

See footnotes at end of table.

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TABLE 1--Continued
ITALY: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued						
Salt:						
Marine, crude[5]	thousand metric tons	600	600	600	600	600
Rock and brine	do.	3,301 r, 3	3,343 r, 3	2,922 r, 3	3,000 r	3,000
Sand and gravel:						
Volcanic sand	do.	100	100	100	100	100
Silica sand	do.	300	300	300	300	300
Other sand and gravel		100,000	100,000	100,000	100,000	100,000
Sodium compounds, n.e.s.:						
Soda ash	thousand metric tons	100	100	100	100	100
Sodium sulfate	do.	125	125	125	125	125
Stone:						
Calcareous:						
Alabaster	do.	25	25	25	25	25
Marble in blocks:						
White	do.	100	100	100	100	100
Colored	do.	3,000	3,000	3,000	3,000	3,000
Travertine	do.	2,500	2,500	2,500	2,500	2,500
Other:						
Granite	do.	100	100	100	100	100
Sandstone	do.	1,800	1,800	1,800	1,800	1,800
Slate	do.	100	100	100	100	100
Crushed and broken:[6]						
Dolomite	do.	700	700	700	700	700
Limestone	do.	120,000	120,000	120,000	120,000	120,000
Marl for cement	do.	14,000	14,000	14,000	14,000	14,000
Serpentine	do.	1,500	1,500	1,500	1,500	1,500
Quartz and quartzite	do.	30	30	30	30	30
Sulfur, recovered as elemental, in compounds, byproducts, other sources	do.	743	702 [3]	692 [3]	688 [3]	680
Talc and related materials		126,868 r, 3	125,040 r, 3	122,849 r, 3	125,000 r	125,000
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bituminous rock, natural		30,000	25,000	25,000	25,000	25,000
Coal:						
Lignite	thousand metric tons	10	10	10	-- r	--
Subbituminous, Sulcis coal		5	5	--	--	--
Coke, metallurgical	thousand metric tons	4,829	4,064 [3]	4,500	4,500	
Gas, natural	million cubic meters	16,000 r	15,000 r	13,000 r	12,570 [3]	13,000
Natural gas liquids	thousand 42-gallon barrels	350	350	350	350	350
Petroleum:						
Crude	do.	23,256	28,424 [3]	30,000	30,000	30,000
Refinery products:						
Liquefied petroleum gas	do.	27,000	27,207 [3]	27,000	27,000	27,000
Gasoline	do.	175,000	184,280 [3]	175,000	175,000	175,000
Naphtha	do.	30,000	30,983 [3]	30,000	30,000	30,000
Jet fuel	do.	36,000	36,000	36,000	36,000	36,000
Kerosene	do.	15,000	15,000	15,000	15,000	15,000
Distillate fuel oil	do.	262,000	289,913 [3]	260,000	260,000	260,000
Residual fuel oil	do.	100,000	105,641 [3]	100,000	100,000	100,000
Other	do.	46,000	46,000	46,000	46,000	46,000
Refinery fuel and losses	do.	1,700	1,700	1,700	1,700	1,700
Total	do.	693,000	737,000	691,000	691,000	691,000

rRevised. -- Zero.
[1]Estimated data are rounded to no more than three significant digits; may not add to totals shown.
[2]Table includes data available through August 2006.
[3]Reported figure.
[4]Antimony content is 83% of gross weight.

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TABLE 1--Continued
ITALY: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

[5]Does not include production from Sardinia and Sicily, which was estimated to be 200,000 metric tons per year.
[6]Output of limestone and serpentine for dimension stone is included with "Stone: Crushed and broken." In addition to the commodities listed, a variety of other dimension stone was produced and previously listed, but available general information was inadequate for continued reliable estimates of output.

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TABLE 2
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		Eurallumina S.p.A. (Comalco Ltd., 56.2%, and Glencore International AG, 43.8%)	Plant at Portoscuso, Sardinia	1,000
Aluminum		Alcoa Italia S.p.A. (Alcoa Inc., 100%)	Smelters at Porto Vesme, Sardinia, and Fusina, near Venice	188
Asbestos		Amiantifera di Balangero S.p.A.	Mine at Balangero, near Turin	100
Barite		Bariosarda S.p.A. (Ente Mineraria Sarda)	Mines at Barega and Mont 'Ega, Sardinia	100
Do.		Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.		Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto Stefano, and Peppixeddu, Sardina	
Do.		Societá Mineraria Baritina S.p.A	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite		Sardabauxiti S.p.A. (Cogein S.p.A., 40%; Comtec S.p.A., 40%; Icofin Co., 20%)	Mine at Olmedo, Sardinia	350
Bentonite		Industria Chimica Carlo Laviosa S.p.A	Mines and plant on Sardinia Island, and a plant near Pisa	250
Cement		52 companies, of which the largest are:		
		Italcementi Fabbriche Riunite Cemento S.p.A.	18 plants, of which the largest are Calusco, Monselice, and Collefero	15,000
Do.		Buzzi Unicem Group	11 plants, of which Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello are the largest	9,000
Do.		Cementerie del Tirreno S.p.A. (Cementir)	6 plants at Arquasta Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	5,300
Copper:				
Refined		Società Metalli Italia S.p.A.	Refinery at Porto Marghera	60
Refined, secondary		Europametalli - LMI S.p.A.	Refinery at Fornaci di Barga	24
Do.		Sitindustrie S.p.A.	Refinery at Pieve Vergonte	22
Feldspar		At least 5 companies, of which the largest are:		1,500
Do.		Maffei S.p.A.	Surface mines at Pinzolo and Campiglia	(200)
Do.		do.	Underground mine at Vipiteno	(300)
Do.		Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.		Sabbie Silicee Fossanova S.P.A. (Sasifo)	Surface mine at Fossanova	(30)
Gold	kilograms	Sargold Resources plc.	Furtei Mine near Cagliaria, Sardinia	1,400
Gypsum		Fassa S.r.l.	Plant at Moncalvo, Asti	90
Lead, metal		Glencore International AG	Refinery at San Gavino, Sardinia	100
Do.		do.	Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	35
Lignite		Ente Nazional per l'Energia Electrica (ENEL)	Surface mine at Santa Barbara (closed)	1,000
Lime		Unicale S.p.A.	Plants in Lombardy region	500
Magnesium, metal		Societa Italiana Magnesio S.p.A. (INDEL)	Plant at Bolzano	8
Marble		A number of companies, of which the largest include:		2,000
		Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	(500)
Do.		Industria dei Marmi Vicentini S.p.A.	do.	(300)
Do.		Figaia S.p.A.	do.	(100)
Nitrogen, N content of ammonia		Hydro Agri S.p.A.	Plant at Ferrara	410
Petroleum:				
Crude		Ente Nazional Idrocarburi (ENI), Government 100%	Oilfields: offshore Sicily, the Adriatic Sea, and onshore in Po River Valley	90
Refined	thousand 42-gallon barrels per day	do.	About 30 refineries	2,000

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TABLE 2--Continued
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Potash ore	Industria Sali Otassici e Affini per Aziono S.p.A.	Underground mines at Corvillo, Pasquasia, Racalmuto, and San Cataldo, in Sicily (closed)	1,300
Do.	Sta Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700
Pumice	Pumex S.p.A.	Quarries, Lipari Island, north of Sicily	600
Do.	Sta Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.)	do.	200
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkahi)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Pontteginori, and Querceto, Tuscany	2,000
Steel	Ilva S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,500)	4,000
Do.	Riva Acciaio S.p.A. (Riva Group)	7 steel plants	7,000
Do.	Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame S.p.A.)	Steel plant at Vicenza	1,000
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and at Orani, Sardinia	120
Do.	Talco Sardegna S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Glencore International AG	Plant at Porto Vesme, Sardinia	60
Do.	Pertulosa Sud S.p.A.	Plant at Crotone, Calabria	100

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TABLE 3
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals		470,527	--	Ethiopia 287,500; Syria 40,000; Romania 20,910.
Alkaline-earth metals		250,303	24	Egypt 102,000; Philippines 40,000; Algeria 36,000.
Aluminum:				
Ore and concentrate	metric tons	41,109	--	South Africa 17,000; Croatia 9,134; Morocco 5,677.
Oxides and hydroxides	do.	643,189	190	Croatia 221,934; Slovenia 161,460; Slovakia 69,454.
Ash or residue containing aluminum		9,793,523	39,160	Spain 3,125,312; Germany 2,320,437; Norway 1,998,562.
Metal, including alloys:				
Scrap		26,750,168	--	Germany 6,320,183; France 5,070,109; China 3,433,875.
Unwrought		49,215,654	9,125	France 22,894,199; Germany 7,692,292; Slovenia 6,365,874.
Semimanufactures:				
Powders and flakes	metric tons	2,023	1	Germany 1,326; Hong Kong, China 241; unspecified Asia 71.
Rods, bars, profiles	do.	154,835	1,361	Germany 48,600; France 25,293; Spain 9,373.
Wire	do.	13,137	123	United Kingdom 1,615; Germany 1,347; Thailand 1,005.
Plates, sheets, strips	do.	147,886	779	Germany 27,453; France 19,876; Spain 19,375.
Foil	do.	121,352	3,859	Germany 27,173; France 17,797; United Kingdom 7,404.
Tubes and pipes	do.	27,896	123	Germany 5,632; France 4,765; United Kingdom 2,091.
Tube or pipe fittings		926,543	19,699	Egypt 139,542; Poland 96,730; Hungary 93,039.
Antimony:				
Ore and concentrate		99,866	38,000	Serbia and Montenegro 22,351; Czech Republic 12,000; Spain 7,375.
Oxides		211,550	--	Germany 42,851; Romania 42,500; Slovenia 36,976.
Metal, including alloys, all forms		7,919	--	Cyprus 5,000; Morocco 2,000; Slovenia 511.
Beryllium, metal, including alloys, all forms		290	--	Turkey 246; Slovenia 4; unspecified 40.
Bismuth, metal, including alloys, all forms		686	207	Mexico 246; Iran 97; Germany 74.
Cadmium, metal, including alloys, all forms		53,458	--	India 50,121; United Kingdom 2,437; Egypt 792.
Chromium:				
Ore and concentrate		3,805,591	38,000	Romania 1,051,250; Austria 853,500; Spain 468,500.
Metal, including alloys, all forms		4,183,717	--	Austria 2,232,937; France 909,000; Poland 328,812.
Cobalt:				
Ore and concentrate		40,233	--	United Kingdom 35,000; Austria 2,500; Portugal 1,437.
Oxides and hydroxides		122,370	593	Turkey 46,507; Belgium 24,027; Netherlands 20,238.
Metal, including alloys, all forms		171,895	62	Portugal 32,047; Germany 30,308; United Kingdom 27,968.
Columbium (niobium) and tantalum, metal, including alloys, all forms, tantalum		2,026	--	Spain 738; France 593; Israel 558.
Copper:				
Ore and concentrate		51,816	--	Germany 33,000; Israel 18,000; Morocco 500.
Matte and speiss, including cement copper		365,836	--	Belgium 217,210; Germany 142,386; Brazil 3,312.
Oxides and hydroxides	metric tons	649	--	Germany 307; Belgium 204; unspecified Asia 21.
Ash and residue containing copper		14,327,717	--	Germany 5,648,730; Spain 5,312,113; Belgium 2,657,062.
Metal, including alloys:				
Scrap	metric tons	98,567	26	Germany 28,345; Austria 25,092; China 21,516.
Unwrought		41,483,579	248,553	France 14,250,041; China 3,292,457; Germany 3,292,457.
Semimanufactures:				
Powders and flakes		4,893,257	694,875	Germany 1,478,847; Spain 763,749; France 464,937.
Rods, bars, profiles	metric tons	78,489	1,422	Germany 19,033; Spain 16,729; France 15,384.
Wire		52,117,618	299,985	Spain 27,311,193; France 5,956,421; Germany 3,161,702.
Plates, sheets, strips	metric tons	69,008	3,183	Germany 21,217; France 9,281; United Kingdom 6,365.
Foil		6,935,655	120,619	Austria 2,528,811; Spain 1,435,651; Germany 576,444.
Tubes and pipes	metric tons	74,763	106	Spain 19,947; France 15,506; United Arab Emirates 5,070.
Tube or pipe fittings		28,891,894	531,375	France 7,211,288; Germany 6,279,757; Spain 2,794,562.
Gold:				
Waste and sweepings		7,187	--	Germany 4,252; United Kingdom 2,839; Spain 82.
Metal, including alloys, unwrought and partly wrought		44,273	2,007	Switzerland 13,866; Croatia 10,519; France 6,491.

See footnotes at end of table.

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TABLE 3—Continued
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations: United States	Destinations: Other (principal)
METALS—Continued				
Iron and steel:				
Iron and concentrate:				
Including roasted pyrite		11,324,161	--	France 10,860,000; Romania 194,140; Germany 105,285.
Excluding roasted pyrite		242,396	--	Romania 194,140; Hungary 47,566; Spain 468.
Pyrite, roasted		11,081,765	--	France 10,860,000; Germany 105,285; Finland 72,855.
Metal:				
Scrap	metric tons	210,770	12	France 89,427; China 54,317; Belgium 16,018.
Pig iron, cast iron, related materials	do.	41,661	173	Turkey 15,8823; Austria 10,075; Belgium 3,222.
Ferroalloys:				
Ferrochromium	do.	8,910	--	Austria 3,977; Slovenia 2,013; Czech Republic 1,069.
Ferromanganese		9,145,860	--	Austria 3,435,562; Slovenia 1,553,937; Germany 841,199.
Ferromolybdenum		161,894	--	Spain 88,000; Germany 35,937; Netherlands 24,000.
Ferronickel		16,739	33	Germany 11,187; Venezuela 4,187; Bosnia and Herzegovina 1,000.
Ferrosilicochromium		2,000	--	All to Bosnia and Herzegovina.
Ferrosilicomanganese		3,162,827	--	Austria 1,707,937; Romania 583,000; Poland 341,812.
Ferrosilicon	metric tons	3,958	--	United Kingdom 848; Luxembourg 509; Slovenia 604.
Ferrotungsten and ferrosilicotungsten		2,296	--	Germany 1,500; Slovenia 796.
Ferrotitanium and ferrosilicotitanium		58,831	--	Germany 27,980; France 24,101; Slovenia 4,750.
Ferrovanadium		59,675	1,937	Netherlands 50,000; Slovenia 3,000; France 2,250.
Ferroniobium		1,750	--	Slovenia 1,250; Venezuela 500.
Silicon metal		722,378	8,375	France 372,562; Spain 324,687; Thailand 4,625.
Unspecified		2,726,759	--	Syria 2,187,000; Hong Kong, China 105,859; Pakistan 55,343.
Steel, primary forms	metric tons	416,644	40,181	France 55,126; Germany 52,156; unspecified Asia 58,488.
Semimanufactures:				
Flat-rolled products:				
Of iron or nonalloy steel:				
Not clad, plated, coated	do.	3,347,648	179,166	France 618,690; Spain 529,878; Greece 485,116.
Clad, plated, coated	do.	1,299,058	5,954	Spain 311,636; France 181,663; Germany 137,576.
Of alloy steel	do.	869,014	34,022	Mexico 171,276; China 120,021; Germany 76,046.
Bars, rods, angles, shapes, sections	do.	4,048,046	235,450	Germany 879,311; France 659,149; Greece 350,020.
Rails and accessories	do.	101,273	9,552	United Kingdom 19,412; Namibia 29,285; Switzerland 12,618.
Wire	do.	426,073	27,492	France 69,731; Germany 47,792; Austria 41,878.
Tubes, pipes, fittings	do.	2,757,098	100,028	Germany 512,781; France 451,986; Spain 170,137.
Lead:				
Ore and concentrate		500	--	All to Hungary.
Oxides	metric tons	12,457	(1)	Egypt 3,408; Slovenia 1,679; United Kingdom 1,672.
Ash and residue containing lead		15,742,882	--	All to Belgium.
Metal, including alloys:				
Scrap		1,991,755	--	France 1,053,437; Greece 810,687; Germany 76,910.
Unwrought		28,624,717	10,062	Spain 13,885,894; Turkey 6,407,875; Austria 3,292,812.
Semimanufactures		4,403,661	--	Czech Republic 2,639,999; France 1,440,272; Iran 66,777.
Lithium oxide and hydroxide		11,295	--	France 4,125; Switzerland 3,937; Romania 1,875.
Magnesium, metal, including alloys:				
Scrap		384,247	--	Brazil 178,238; Austria 92,621; United Kingdom 53,398.
Unwrought		4,211,002	--	Norway 3,562,812; United Kingdom 192,726; Brazil 122,122.
Semimanufactures		1,096,971	--	France 211,608; Germany 177,530; Austria 87,335.
Manganese:				
Ore and concentrate		225,474	--	Turkey 215,898; Spain 6,375; Slovenia 2,125.
Oxides	metric tons	148	--	Serbia and Montenegro 52; Poland 44; Slovenia 28.
Metal, including alloys, all forms		113,843	--	Luxembourg 56,000; France 25,617; Croatia 10,125.
Mercury		6,920	--	Tunisia 2,000; Cuba 1,875; Turkey 1,375.

See footnotes at end of table.

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TABLE 3—Continued
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS—Continued				
Molybdenum:				
Ore and concentrate:				
Roasted		283,029	--	Netherlands 168,023; Turkey 51,210; Germany 44,980.
Unroasted		52,507	--	France 40,300; Brazil 4,375; Belgium 4,062.
Oxides and hydroxides		20,815	--	Germany 20,812; unspecified 3.
Metal, including alloys:				
Scrap and unwrought		48,640	--	Germany 26,187; France 22,453.
Semimanufactures		129,252	48	Germany 116,996; France 4,937; Spain 2,000.
Nickel:				
Ore and concentrate		296	--	All to Iran.
Matte and speiss		246	238	Switzerland 8.
Oxides and hydroxides		41,875	--	Brazil 26,000; Germany 5,875; Belgium 5,000.
Metal, including alloys:				
Scrap		643,744	25,480	Germany 343,312; France 162,589; United Kingdom 91,363.
Unwrought		1,679,983	199	Germany 539,456; Portugal 172,144; France 145,109.
Semimanufactures		2,810,077	336,136	Germany 367,265; United Kingdom 302,355; China 204,261.
Platinum-group metals:				
Waste and sweepings		10,522	--	Switzerland 10,504; France 18.
Metal, including alloys, unwrought and partly wrought:				
Palladium		3,338	1,254	Switzerland 565; Germany 285; United Kingdom 255.
Platinum		6,332	1,342	France 1,729; Switzerland 1,324; United Kingdom 504.
Rhodium		544	1	Hong Kong, China 183; Switzerland 96; unspecified 36.
Iridium, osmium, ruthenium		328	--	Hong Kong, China 225; United Kingdom 9; unspecified 87.
Rare-earth metals, including alloys, all forms		80,645	26,148	Serbia and Montenegro 24,699; Iran 20,000; Belarus 5,625.
Selenium, elemental		6,794	--	United Kingdom 4,000; Brazil 1,750; Finland 250.
Silicon, high-purity		946,860	362,562	France 200,078; Japan 110,964; Malaysia 107,914.
Silver:				
Ore and concentrate	value	$1,421	--	All to Mexico.
Metal, including alloys, unwrought and partly wrought		638,475	9,532	Spain 105,422; France 63,942; Germany 56,303.
Tin:				
Ore and concentrate		19,937	--	France 19,121; United Kingdom 816.
Metal, including alloys:				
Scrap		179,758	--	Netherlands 103,796; United Arab Emirates 40,714; Canada 24,878.
Unwrought		405,046	152	Poland 122,229; Turkey 106,175; United Kingdom 47,371.
Semimanufactures		971,675	21,511	Austria 411,000; United Kingdom 120,160; Romania 81,163.
Titanium:				
Ore and concentrate		19,462	--	Spain 16,464; Portugal 2,187; unspecified 811.
Oxides		16,464,029	5,232,058	United Kingdom 1,598,312; Mexico 796,000; France 763,687.
Metal, including alloys:				
Powders, unwrought, scrap		176,105	40,796	Germany 69,410; Poland 19,378; unspecified Asia 17,199.
Semimanufactures	metric tons	4,290	173	Germany 1,777; United Kingdom 276; France 229.
Tungsten:				
Ore and concentrate		500	--	All to Mexico.
Metal, including alloys:				
Scrap and unwrought		1,631	19	Germany 1,125; France 85; Slovakia 52.
Semimanufactures		403,223	175	Germany 209,316; Ethiopia 93,531; United Kingdom 68,826.
Vanadium:				
Oxides and hydroxides		13,426	156	Oman 12,500; Vietnam 769; unspecified 1.
Metal, including alloys, all forms		4,683	--	Algeria 3,375; Poland 1,187; Spain 97.

See footnotes at end of table.

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TABLE 3—Continued
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS—Continued				
Zinc:				
Ore and concentrate	metric tons	96,605	--	Belgium 30,364; Germany 20,313; France 18,328.
Oxides		12,009,868	--	Spain 6,548,015; France 2,286,125; Germany 1,140,000.
Blue powder		2,975,515	54	Belgium 1,269,812; Brazil 925,562; United Kingdom 726,437.
Ash and residue containing zinc		10,055,452	--	France 2,115,312; Austria 1,626,875; Netherlands 1,609,816.
Metal, including alloys:				
Scrap		15,156,921	--	China 9,411,246; India 3,458,875; Germany 511,812.
Unwrought		5,964,790	--	Slovenia 1,243,812; Tunisia 1,158,437; Austria 1,110,726.
Zirconium:				
Ore and concentrate		25,829,796	--	Turkey 8,410,000; Iran 4,594,113; Egypt 3,468,812.
Metal, including alloys:				
Scrap and unwrought		110,062	--	Switzerland 75,000; Spain 20,000; Romania 11,062.
Semimanufactures		331,328	--	Pakistan 116,800; Vietnam 75,000; Romania 42,101.
Other, ash and residue		53,502,956	170,324	Belgium 19,629,193; Germany 11,328,604; Spain 9,851,736.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc.	metric tons	337,176	147,200	United Kingdom 101,580; Germany 57,743; Netherlands 15,229.
Artificial:				
Corundum		31,037,257	5,159,269	Austria 7,247,496; Germany 6,428,980; France 2,006,000.
Silicon carbide		7,824,272	8,125	France 5,981,210; Germany 783,000; Turkey 202,160.
Dust and powder of precious and semiprecious stones, including diamond	value	$3,632,892	$36,210	Indonesia $428,252; Hong Kong, China $412,925; unspecified $1,415,955.
Grinding and polishing wheels and stones		47,444,779	1,026,869	Spain 5,427,795; France 3,608,853; Turkey 2,002,390.
Barite and witherite		1,953,606	--	Croatia 1,118,750; Albania 439,750; Czech Republic 139,199.
Boron materials, crude natural borates		9,132,367	--	France 8,570,054; Slovakia 298,000; Germany 124,421.
Cement	metric tons	2,055,303	139	Albania 475,263; Spain 392,715; Malta 283,892.
Chalk		1,278,995	36,000	Syria 378,000; Romania 338,312; Greece 112,957.
Clays, crude:				
Bentonite	metric tons	258,918	20	France 71,562; Germany 62,355; Spain 52,096.
Chamotte earth and Dinas earth		2,518,397	--	Switzerland 1,691,812; Algeria 504,937; Finland 77,941.
Fire clay		608,149	20,000	Tunisia 261,812; Romania 98,222; Switzerland 50,750.
Fuller's earth	metric tons	72	--	Switzerland 57; Croatia 9; Serbia and Montenegro 2.
Kaolin		29,996,751	26,894	Austria 11,031,691; Spain 9,483,523; France 2,974,625.
Diamond, natural:				
Gem, not set or strung	value	$49,947,762	$4,446,606	Switzerland $11,466,983; Hong Kong, China $8,232,721; Israel $9,642,965.
Industrial stones	do.	$1,034,052	$265,754	Hong Kong, China $376,123; Switzerland $160,691; Malta $61,820.
Dust and powder	do.	$3,597,179	$34,380	Indonesia $428,252; Hong Kong, China $412,915; unspecified $1,415,955.
Diatomite and other infusorial earth		1,741,374	226,582	Germany 364,625; Switzerland 284,250; Albania 104,917.
Feldspar	metric tons	204,221	--	Spain 185,546; Germany 6,739; Morocco 2,852.
Fertilizer materials:				
Crude, n.e.s.		93,616,066	197,722	Indonesia 51,180,230; Spain 12,429,484; France 9,330,519.
Manufactured:				
Ammonia		357,481	28,222	Ireland 142,687; Croatia 67,261; France 30,328.
Nitrogenous	metric tons	232,221	1,993	Turkey 63,031; Kenya 35,700; Greece 29,714.
Phosphatic		20,685,990	--	Morocco 15,732,113; Austria 2,246,500; Denmark 1,011,750.
Potassic	metric tons	1,174	--	Greece 225; Slovenia 152; Bosnia and Herzegovina 136.
Unspecified and mixed	do.	387,090	4,336	Turkey 65,129; Greece 65,129; Kenya 35,700.
Fluorspar	do.	23,108	--	Greece 18,090; Cyprus 4,730; Serbia and Montenegro 168.

See footnotes at end of table.

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TABLE 3—Continued
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
INDUSTRIAL MINERALS—Continued				
Graphite, natural		659,807	2,198	Spain 179,996; Algeria 106,000; Germany 79,988.
Gypsum and plaster		50,416,417	5,030,862	France 17,214,917; Greece 6,225,937; Switzerland 6,054,753.
Iodine		3,074	--	Belgium 2,000; France 656; Czech Republic 199.
Kyanite and related materials:				
Andalusite, kyanite, sillimanite		14,375	--	All to France.
Mullite		109,132	--	France 92,070; Hungary 13,875; Brazil 3,187.
Lime	metric tons	37,469	29	Mali 12,924; Serbia and Montenegro 10,509; France 3,965.
Magnesium compounds:				
Magnesite, crude		2,911,120	18,601	Spain 829,812; Thailand 671,000; France 235,472.
Oxides and hydroxides		9,783,764	36,398	Spain 2,464,062; France 2,014,875; Germany 842,125.
Other		82,196	--	Spain 71,000; Slovenia 7,000; Portugal 4,187.
Mica:				
Crude, including splittings and waste		657,570	144	Netherlands 337,500; United Kingdom 87,789; Costa Rica 51,480.
Worked, including agglomerated splittings		70,232	1,062	Romania 14,074; Ethiopia 8,625; Spain 7,812.
Nitrates, crude	metric tons	286	--	Serbia and Montenegro 263; Israel 18; Switzerland 5.
Phosphates, crude	do.	4,417	--	Switzerland 4,334; Serbia and Montenegro 69; Croatia 10.
Pigments, mineral, iron oxides and hydroxides, processed	do.	26,273	8,293	Germany 5,710; United Kingdom 3,865; Spain 1,543.
Potassium salts, crude		2	--	Unspecified 2.
Precious and semiprecious stones other than diamond:				
Natural	value, thousands	$18,683	$2,063	Switzerland $6,338; Hong Kong, China $2,039; Israel $1,525.
Synthetic	do.	$5,244	$92	Switzerland $1,085; Hong Kong, China $1,068; Turkey $751.
Pyrite, unroasted		8,524,647	603,312	Germany 2,808,687; Luxembourg 2,018,687; Poland 421,812.
Quartz crystal, piezoelectric	value	$1,752,713	$163,754	France $425,004; Germany $385,241; Spain $217,483.
Salt and brine	metric tons	290,046	57,164	Germany 68,061; Turkey 32,997; United Kingdom 27,008.
Sodium compounds, n.e.s., natural and/or manufactured, sulfate		988,047	--	Romania 338,812; Spain 172,785; Switzerland 118,250.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	metric tons	944,854	36,857	China 167,816; Tunisia 74,116; Libya 58,374.
Worked	do.	2,254,120	487,549	Saudi Arabia 153,327; Germany 132,859; Switzerland 119,112.
Dolomite, chiefly refractory-grade		55,400,406	34,890	France 37,092,038; Germany 3,749,750; India 2,517,000.
Gravel and crushed rock	metric tons	1,486,629	2,463	Germany 352,611; Switzerland 272,587; Tunisia 138,297.
Limestone, other than dimension	do.	305	--	French Polynesia 106; Saudi Arabia 86; Algeria 50.
Quartz and quartzite		33,576,900	22,375	France 19,207,432; Germany 3,526,749; Austria 2,236,230.
Sand other than metal-bearing		96,688,355	55,175	Switzerland 58,214,472; Spain 9,326,167; Germany 4,534,749.
Sand and gravel	metric tons	1,583,318	2,519	Germany 357,146; Switzerland 330,802; Tunisia 138,617.
Sulfur:				
Elemental:				
Crude, including native and byproduct	do.	171,480	(1)	Turkey 65,205; Tunisia 41,770; Croatia 18,151.
Colloidal, precipitated, sublimed	do.	930	--	Germany 607; Croatia 244; Bosnia and Herzegovina 49.
Sulfuric acid	do.	312,848	156	Spain 99,211; Tunisia 73,014; Turkey 44,828.
Talc, steatite, soapstone, pyrophyllite	do.	124,715	520	Germany 49,647; Spain 21,702; Belgium 9,765.
Vermiculite, perlite, chlorite	do.	28,887	--	France 14,301; United Kingdom 11,166; Germany 2,590.
Other, slag and dross, not metal-bearing	do.	2,019,912	829,803	Spain 547,180; Croatia 404,814; Côte d'Ivoire 75,073.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural		589,349	--	Dominican Republic 363,375; Lebanon 83,890; Serbia and Montenegro 57,953.
Carbon black		86,612,967	1,728,000	Turkey 24,159,183; Germany 17,552,039; Spain 14,953,324.

See footnotes at end of table.

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TABLE 3—Continued
ITALY: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS—Continued				
Coal:				
Anthracite		32,225,203	30,043,210	France 506,437; Croatia 351,125; Sri Lanka 269,125.
Bituminous	metric tons	58,706	--	Croatia 54,247; Bosnia and Herzegovina 3,926; Lebanon 388.
Briquets of anthracite and bituminous coal		87,765	--	Hong Kong, China 60,574; Croatia 21,781; Mali 4,687.
Lignite, including briquets		119,611	--	Albania 112,597; Morocco 6,000; India 386.
All grades, including briquets	metric tons	92,435	30,043	Croatia 54,247; Bosnia and Herzegovina 3,926; France 1,140.
Coke and semicoke	do.	259,123	--	Germany 71,117; France 70,159; Turkey 22,822.
Gas, manufactured		2,127	--	Cuba 2,000; Tunisia 117; unspecified 10.
Gas, natural:				
Gaseous	metric tons	299,160	--	Croatia 248,682; Switzerland 41,218; Slovenia 4,417.
Liquefied	do.	387,540	--	Spain 387,507; Libya 15; Brazil 10.
Peat, including briquets and litter		5,681,181	--	Switzerland 1,704,687; Bosnia and Herzegovina 1,053,437; France 1,007,937.
Petroleum:				
Crude	metric tons	824,206	--	France 273,152; Turkey 150,244; Germany 131,325.
Refinery products:				
Liquefied petroleum gas	do.	608,794	26,397	Turkey 130,623; France 97,860; Tunisia 76,905.
Mineral jelly and wax		62,304,121	10,000	Germany 51,341,444; Netherlands 4,670,132; Spain 1,032,713.
Asphalt	metric tons	676,772	--	Spain 114,099; Tunisia 91,258; Romania 78,938.
Bitumen and other residues	do.	677,435	--	Spain 114,260; Tunisia 91,258; Romania 78,938.
Bituminous mixtures		2,255,842	--	Switzerland 615,312; Albania 457,687; Slovenia 195,109.
Petroleum coke	metric tons	124,129	--	Greece 44,550; France 34,400; Turkey 28,377.

[1]Less than ½ unit.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed August 23, 2006, at URL http://unstats.un.org/unsd/comtrade.

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TABLE 4
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals		1,073,813	23,694	Germany 261,999; France 248,472; Belgium 204,875.
Alkaline-earth metals		276,620	17,687	Netherlands 216,171; China 40,800; Germany 1,437.
Aluminum:				
Ore and concentrate	metric tons	2,409,658	698	Australia 2,318,830; China 68,495; Guyana 11,587.
Oxides and hydroxides	do.	296,998	2,136	France 108,661; Spain 63,907; Germany 58,438.
Ash or residue containing aluminum		10,962,055	--	Australia 7,394,101; France 840,625; Greece 562,625.
Metal, including alloys:				
Scrap	metric tons	356,038	44	Germany 141,359; France 85,412; Switzerland 41,892.
Unwrought	do.	908,019	369	Mozambique 111,895; Russia 80,555; Serbia and Montenegro 77,104.
Semimanufactures:				
Powders and flakes	do.	4,487	585	Germany 1,857; United Kingdom 731; Spain 485.
Rods, bars, profiles	do.	39,273	282	Germany 11,035; Netherlands 4,186; Slovenia 3,154.
Wire	do.	40,797	803	France 14,217; South Africa 6,939; Spain 3,853.
Plates, sheets, strips	do.	384,589	1,268	Germany 120,281; United Kingdom 45,038; France 43,994.
Foil		56,080,674	214,057	Germany 16,406,503; France 5,744,784; Spain 5,410,209.
Tubes and pipes	metric tons	6,504	53	Belgium 2,221; Germany 1,497; Denmark 1,200.
Tube or pipe fittings	do.	410	8	Netherlands 93; Germany 92; United Kingdom 56.
Antimony:				
Ore and concentrate		878,881	226	Bolivia 786,937; Belgium 44,000; Spain 24,000.
Oxides		5,531,150	316	China 2,201,000; France 1,490,812; Belgium 1,244,875.
Metal, including alloys, all forms		743,587	--	China 448,000; Belgium 95,910; Vietnam 50,000.
Arsenic, metal, including alloys, all forms		84,025	--	China 74,000; Netherlands 10,000; France 12.
Beryllium, metal, including alloys, all forms		15,399	12	China 13,312; United Kingdom 1,375; Germany 479.
Bismuth, metal, including alloys, all forms		174,608	97	Belgium 86,859; United Kingdom 31,164; Germany 22,660.
Cadmium, metal, including alloys, all forms		86,968	1	Macedonia 37,578; Peru 35,000; Germany 14,332.
Chromium:				
Ore and concentrate	metric tons	31,166	--	South Africa 27,711; France 1,221; Albania 1,088.
Oxides and hydroxides	do.	5,875	9	United Kingdom 1,661; Russia 1,288; Kazakhstan 753.
Metal, including alloys, all forms		676,927	5,628	France 371,625; Austria 120,010; United Kingdom 100,632.
Cobalt:				
Ore and concentrate		121,960	--	Germany 120,000; France 1,312; Belgium 648.
Oxides and hydroxides		1,013,336	--	Russia 344,750; Belgium 244,824; Finland 172,523.
Metal, including alloys, all forms		464,499	8,062	Belgium 158,558; France 88,385; Finland 66,264.
Columbium (niobium) and tantalum, metal, including alloys, all forms, tantalum		1,722	615	Germany 522; Austria 394; Japan 85.
Copper:				
Ore and concentrate		462,725	--	Germany 379,000; Greece 38,910; France 30,140.
Matte and speiss, including cement copper		5,804	--	United Kingdom 5,750; Netherlands 52; unspecified 2.
Oxides and hydroxides		804,663	264,875	Germany 229,070; Mexico 93,558; Belgium 67,019.
Sulfate		703,182	--	Germany 383,562; Spain 125,027; France 72,511.
Ash and residue containing copper		624,132	--	France 379,625; Spain 194,429; Belgium 27,078.
Metal, including alloys:				
Scrap	metric tons	131,130	27	Germany 31124; France 30,307; Spain 13,363.
Unwrought	do.	717,792	5,316	Chile 424,218; Peru 63,917; Russia 51,026.
Semimanufactures:				
Powders and flakes		3,158,185	51,667	Germany 1,495,640; Serbia and Montenegro 577,562; United Kingdom 320,011.
Rods, bars, profiles		36,734,627	32,323	Germany 15,101,791; France 7,583,003; Spain 3,981,343.
Wire	metric tons	194,361	260	France 79,296; Germany 49,730; Spain 35,431.
Plates, sheets, strips	do.	85,025	35	Germany 38,433; Finland 13,346; France 10,492.
Foil		13,236,102	36,111	China 2,698,207; Spain 1,760,433; Germany 1,454,920.
Tubes and pipes		54,614,941	170,900	Germany 22,568,338; France 8,520,577; Greece 7,187,522.
Tube or pipe fittings		8,186,437	102,589	Germany 3,759,625; Spain 1,282,937; China 1,153,858.

See footnotes at end of table.

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TABLE 4—Continued
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources: United States	Sources: Other (principal)
METALS—Continued				
Germanium, metal, including alloys, all forms		471	24	France 253; China 97; Belgium 70.
Gold:				
Waste and sweepings		44,652	--	France 25,062; United Kingdom 4,281; Germany 4,250.
Metal, including alloys, unwrought, and partly wrought		275,025	204	Switzerland 144,977; South Africa 64,401; Russia 31,386.
Iron and steel:				
Iron and concentrate:				
Including roasted pyrite	metric tons	16,714,771	75	Brazil 11,031,416; Mauritania 1,716,705; Canada 1,375,520.
Excluding roasted pyrite	do.	16,714,771	74	Do.
Pyrite, roasted		316	316	NA
Metal:				
Scrap	metric tons	5,605,841	159,651	Germany 1,446,529; France 1,083,234; Austria 766,664.
Pig iron, cast iron, related materials	do.	1,569,213	730	Ukraine 695,597; Russia 425,575; Brazil 61,155.
Ferroalloys:				
Ferrochromium	do.	400,184	179	South Africa 238,429; Zimbabwe 66,781; Albania 33,369.
Ferromanganese		82,875,162	--	Spain 21,809,152; Norway 18,707,027; France 18,004,612.
Ferromolybdenum	metric tons	7,300	--	United Kingdom 2,314; Belgium 1,398; Austria 1,285.
Ferronickel	do.	82,107	40	Colombia 26,740; Ukraine 12,953; Macedonia 12,182.
Ferrosilicochromium		5,000	--	All from Colombia.
Ferrosilicomanganese	metric tons	183,260	--	Ukraine 28,271; Norway 27,163; India 24,087.
Ferrosilicon	thousand metric tons	122	--	Netherlands 25; Bosnia and Herzegovina 13; France 10.
Ferrotungsten and ferrosilicotungsten		229,448	--	Netherlands 94,078; Luxembourg 60,000; Austria 39,601.
Ferrotitanium and ferrosilicotitanium		3,386,061	--	Germany 1,179,000; Netherlands 1,117,375; United Kingdom 725,500.
Ferrovanadium		1,895,294	--	Austria 658,125; Netherlands 419,000; Germany 392,125.
Ferroniobium		1,402,683	--	Netherlands 1,161,500; Germany 188,246; Austria 47,000.
Silicon metal		46,150,763	7	Brazil 22,335,996; France 9,570,347; Germany 3,889,187.
Unspecified		17,228,134	--	Germany 7,473,988; France 2,612,812; Brazil 2,216,250.
Steel, primary forms	metric tons	3,891,724	37	Ukraine 1,509,910; Russia 667,160; Turkey 373,152.
Semimanufactures:				
Flat-rolled products:				
Of iron or nonalloy steel:				
Not clad, plated, coated	do.	6,588,187	725	Germany 814,974; Russia 774,827; France 747,119.
Clad, plated, coated	do.	2,298,491	41,266	France 486,425; Germany 322,804; Austria 220,211.
Of alloy steel	do.	2,326,297	18,346	France 754,955; Germany 332,558; Netherlands 167,674.
Bars, rods, angles, shapes, sections	do.	3,046,224	379	Germany 691,194; Turkey 400,335; Spain 241,858.
Rails and accessories		35,266,358	60	Austria 19,382,712; Luxembourg 5,673,132; France 5,406,690.
Wire	metric tons	233,177	204	France 31,456; Austria 28,402; Ukraine 27,493.
Tubes, pipes, fittings	do.	1,083,513	27,129	Germany 210,765; Russia 139,931; France 107,592.
Lead:				
Ore and concentrate		99,214,547	29,580,421	Netherlands 17,390,785; Ireland 14,081,746; Peru 9,570,839.
Oxides		783,606	--	United Kingdom 397,870; Germany 196,725; Spain 125,000.
Ash and residue containing lead		11,312	--	Israel 10,000; unspecified 1,312.
Metal, including alloys:				
Scrap	metric tons	3,948	41	Libya 2,118; Slovenia 343; Serbia and Montenegro 258.
Unwrought	do.	115,669	21,353	China 19,667,453; Peru 15,719,382; Australia 12,796,109.
Semimanufactures	do.	8,191	(1)	Germany 3,177; Belgium 2,493; United Kingdom 1,765.
Lithium oxide and hydroxide		148,472	--	Belgium 108,980; China 20,000; Germany 12,687.
Magnesium, metal, including alloys:				
Unwrought		15,833,265	2,375	China 9,408,362; Israel 1,294,625; Denmark 1,204,000.
Semimanufactures		2,366,738	10,937	China 1,209,773; Germany 623,011; Canada 233,507.

See footnotes at end of table.

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TABLE 4—Continued
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS—Continued				
Manganese:				
Ore and concentrate	metric tons	206,256	--	Gabon 87,340; South Africa 68,108; Brazil 34,196.
Oxides		2,514,214	196,304	Belgium 765,000; India 400,000; Germany 308,054.
Metal, including alloys, all forms		4,990,192	78,968	China 2,904,812; Netherlands 827,625; Germany 387,437.
Mercury		73,890	--	Spain 50,746; Germany 20,761; Belgium 1,187.
Molybdenum:				
Ore and concentrate:				
Roasted		4,657,436	5,000	Netherlands 1,609,312; Chile 1,323,000; Belgium 1,185,375.
Unroasted		61,110	2,437	China 32,000; Austria 19,535; United Kingdom 6,125.
Oxides and hydroxides		246,582	--	Germany 134,375; Netherlands 74,203; Luxembourg 24,000.
Metal, including alloys:				
Scrap and unwrought		10,875	1,636	Germany 4,625; China 3,531; Austria 789.
Semimanufactures		98,213	21,339	Austria 39,456; China 22,387; Germany 11,382.
Nickel:				
Matte and speiss		353,381	--	Netherlands 229,500; Russia 98,898; Belgium 16,000.
Oxides and hydroxides		101,750	--	Netherlands 87,605; Finland 10,125; Germany 3,500.
Metal, including alloys:				
Scrap		3,075,086	20,488	France 2,235,562; Germany 356,187; Switzerland 160,605.
Unwrought	metric tons	45,053	653	United Kingdom 14,506; Australia 8,751; Netherlands 7,755.
Semimanufactures		5,157,181	279,649	Germany 1,452,588; France 831,828; Sweden 653,794.
Platinum-group metals:				
Waste and sweepings		278	29	United Kingdom 226; Switzerland 22; France 1.
Metal, including alloys, unwrought, and partly wrought:				
Palladium		18,664	4,125	Russia 5,5318; United Kingdom 3,545; South Africa 2,561.
Platinum		12,195	2,007	South Africa 2,649; France 1,906; United Kingdom 1,808.
Rhodium		1,798	437	South Africa 432; Russia 390; United Kingdom 335.
Iridium, osmium, ruthenium		1,029	186	Germany 300; South Africa 182; United Kingdom 164.
Rare-earth metals, including alloys, all forms		87,311	17,406	India 40,000; Austria 19,574; Republic of Korea 3,625.
Selenium, elemental		46,877	--	Canada 16,000; Germany 13,750; Sweden 8,625.
Silicon, high-purity		443,818	132,554	China 184,203; Germany 73,703; Slovenia 25,000.
Silver:				
Ore and concentrate		1,428	--	Belgium 1,200; Switzerland 180; France 47.
Metal, including alloys, unwrought and partly wrought		1,823,325	6,173	Germany 1,022,899; Switzerland 491,521; Kazakhstan 93,501.
Tin:				
Ore and concentrate		241,039	--	All from Germany.
Metal, including alloys:				
Scrap		47,456	--	Greece 24,929; Malta 19,402; Croatia 3,125.
Unwrought		5,761,021	7	Indonesia 2,416,000; Malaysia 1,059,375; Peru 525,000.
Semimanufactures		1,753,182	3,671	Netherlands 719,312; Germany 703,034; Austria 82,062.
Titanium:				
Ore and concentrate	metric tons	88,502	--	Norway 79,633; Canada 5,478; South Africa 1,724.
Oxides	do.	23,418	2,764	Germany 4,284; Czech Republic 3,232; China 2,336.
Metal, including alloys:				
Powders, unwrought, scrap		2,822,495	133,941	Germany 1,780,750; Russia 403,687; Netherlands 232,902.
Semimanufactures	metric tons	3,762	722	Germany 1,195; Japan 1,014; United Kingdom 148.
Tungsten:				
Ore and concentrate		2,812	--	All from United Kingdom.
Metal, including alloys:				
Scrap and unwrought		184,626	36,889	Republic of Korea 40,550; Germany 25,741; China 24,862.
Semimanufactures		138,568	10,906	Germany 40,862; United Kingdom 26,870; China 20,268.

See footnotes at end of table.

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TABLE 4—Continued
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources: United States	Sources: Other (principal)
METALS—Continued				
Vanadium:				
Oxides and hydroxides		139,409	67,226	Netherlands 35,617; United Kingdom 27,042; Belgium 5,000.
Metal, including alloys, all forms		18,126	183	China 17,601; Japan 199; Germany 128.
Zinc:				
Ore and concentrate	metric tons	250,489	71,645	Ireland 62,140; Australia 48,702; Honduras 17,697.
Oxides		20,131,530	67,246	Spain 3,653,437; Netherlands 3,213,812; China 3,060,812.
Blue powder		3,615,256	233,218	Belgium 1,591,000; Denmark 644,437; Spain 374,375.
Ash and residue containing zinc		14,819,681	--	France 6,792,124; Austria 1,706,812; Germany 1,181,000.
Metal, including alloys:				
Scrap		16,028,730	--	Germany 5,198,613; France 4,795,273; Switzerland 1,466,687.
Unwrought	metric tons	314,077	(1)	Spain 100,811; Belgium 45,024; Namibia 21,129.
Zirconium:				
Ore and concentrate	do.	149,787	33,209	Australia 66,658; South Africa 48,076; Sri Lanka 932.
Metal, including alloys:				
Scrap and unwrought		84,815	4,625	Germany 62,914; Sweden 12,250; Netherlands 3,937.
Semimanufactures		65,609	33,272	France 16,539; United Kingdom 4,250; unspecified Asia 6,875.
Other, ash and residue		27,199,024	2,625	France 8,116,549; Australia 7,394,101; Germany 1,523,843.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, and so forth		23,916,492	53,882	Turkey 9,256,648; Greece 8,711,000; India 2,317,000.
Artificial:				
Corundum		67,954,837	2,375	China 34,989,644; Austria 8,289,703; Ukraine 6,180,039.
Silicon carbide		32,012,358	557,437	Sweden 8,182,601; Romania 5,486,605; Switzerland 4,556,031.
Dust and powder of precious and semiprecious stones, including diamond	value	$57,021,151	$2,434,635	Switzerland $40,620,144; Ireland $3,790,150; Belgium $2,530,228.
Grinding and polishing wheels and stones		12,101,773	115,744	Germany 2,601,896; Austria 1,824,350; France 1,031,823.
Barite and witherite		87,000,697	1,000	Bulgaria 54,691,601; Spain 14,607,964; Turkey 10,090,000.
Boron materials:				
Crude natural borates		32,478,873	--	Turkey 31,884,480; United Kingdom 319,625; Spain 220,800.
Oxides and acids		26,333,530	4,957,453	Turkey 10,040,882; Russia 3,563,875; Spain 2,280,375.
Cement	metric tons	5,007,949	136	Turkey 2,142,954; Egypt 1,057,494; Greece 378,712.
Chalk		14,418,086	27,242	France 13,829,183; Greece 136,000; Germany 113,222.
Clays, crude:				
Bentonite	metric tons	153,412	5,536	India 43,404; Greece 41,731; Turkey 20,444.
Chamotte earth and Dinas earth		91,023,805	1,106,062	Germany 32,324,164; France 27,699,644; Bulgaria 18,758,644.
Fire clay	metric tons	1,539,339	--	Ukraine 1,359,693; Germany 114,996; France 26,351.
Fuller's earth		5,759,631	1,226,750	Germany 1,499,437; Senegal 1,000,000; Spain 782,375.
Kaolin	metric tons	950,685	120,277	France 177,757; United Kingdom 169,766; Germany 164,091.
Diamond, natural:				
Gem, not set or strung	value, thousands	$393,586	$28,949	Belgium $242,681; Israel $48,091; India $31,751.
Industrial stones	value	$11,114,942	$37,997	Belgium $9,521,267; United Kingdom $803,085; Germany $309,068.
Dust and powder	do.	$55,725,964	$2,406,387	Switzerland $39,556,201; Ireland $3,790,150; Belgium $2,528,143.
Diatomite and other infusorial earth		15,101,792	601,375	Switzerland 9,103,500; France 3,070,687; Spain 1,504,687.
Feldspar	metric tons	2,693,872	3,170	Turkey 2,608,517; France 37,306; Germany 19,593.
Fertilizer materials:				
Crude, n.e.s.		36,743,815	106,398	Germany 8,782,714; Austria 8,528,730; Spain 7,947,250.
Manufactured:				
Ammonia		78,279,190	44,722	Libya 21,742,886; Egypt 14,517,441; Russia 12,983,867.
Nitrogenous	metric tons	1,438,346	171	Russia 444,448; Austria 158,553; Libya 122,973.
Phosphatic	do.	198,397	--	Tunisia 70,788; Lebanon 42,515; Bulgaria 38,976.
Potassic	do.	521,794	(1)	Germany 223,633; Israel 156,401; Jordan 48,203.
Unspecified and mixed	do.	3,170,465	2,337	Russia 558,642; Germany 364,847; Tunisia 322,812.

See footnotes at end of table.

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TABLE 4—Continued
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
INDUSTRIAL MINERALS—Continued				
Fluorspar	metric tons	212,935	--	China 75,594; Mexico 43,480; South Africa 33,023.
Graphite, natural		10,870,293	40,573	China 4,461,406; Austria 1,959,000; Germany 1,502,148.
Gypsum and plaster	metric tons	30,146	2,230	Germany 17,607; France 16,915; United Kingdom 2,372.
Iodine		1,127,937	539	Japan 548,687; Belgium 492,812; Netherlands 76,261.
Kyanite and related materials:				
Andalusite, kyanite, sillimanite	metric tons	12,101	2,945	South Africa 5,832; France 2,158; Germany 1,152.
Mullite		3,206,020	347,437	Germany 1,549,312; Hungary 693,000; China 354,375.
Lime	metric tons	41,967	--	Slovenia 19,817; Austria 6,320; United Kingdom 6,285.
Magnesium compounds:				
Magnesite, crude		9,429,248	--	Turkey 8,024,199; Germany 566,625; Netherlands 459,125.
Oxides and hydroxides	metric tons	165,155	552	Greece 52,453; China 45,802; Austria 14,680.
Other		6,796,859	--	Germany 6,503,210; China 180,000; India 110,000.
Mica:				
Crude, including splittings and waste		3,562,469	159,589	Germany 1,084,835; France 773,733; Austria 726,187.
Worked, including agglomerated splittings		833,404	28,191	China 333,769; Belgium 251,363; Germany 80,046.
Nitrates, crude		3,803,436	--	Chile 1,989,125; Germany 1,081,562; Poland 447,687.
Phosphates, crude	metric tons	359,055	12	Morocco 174,894; Germany 88,656; Syria 66,432.
Phosphorus, elemental		7,997,462	12	China 7,996,230; Netherlands 1,187; Germany 24.
Pigments, mineral, iron oxides and hydroxides, processed		43,188,611	2,881,375	Germany 12,296,152; France 6,670,934; Spain 6,104,562.
Precious and semiprecious stones other than diamond:				
Natural	value, thousands	$74,108	$2,242	Switzerland $18,790; Thailand $13,849; India $9,707.
Synthetic	do.	$8,330	$291	China $3,239; Switzerland $1,665; Hong Kong, China $683.
Pyrite, unroasted		8,929,163	--	Russia 8,768,738; Austria 58,351; China 44,000.
Quartz crystal, piezoelectric	value	$181,588	$8,276	China $83,032; Germany $41,540; Brazil $15,511.
Salt and brine	metric tons	838,274	47	Tunisia 374,743; France 200,541; Germany 196,288.
Sodium compounds, n.e.s., natural and/or manufactured:				
Soda ash	metric tons	319,830	34	Ukraine 87,408; Turkey 86,160; Bulgaria 83,542.
Sulfate	do.	251,631	--	Spain 167,668; Austria 36,975; China 23,192.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	do.	2,143,335	18,171	India 556,457; China 291,682; South Africa 161,777.
Worked	do.	356,911	2,784	China 155,172; Argentina 44,651; Brazil 40,691.
Dolomite, chiefly refractory-grade		12,326,189	--	Austria 6,738,691; Germany 4,032,812.
Gravel and crushed rock	metric tons	3,978,838	18	Croatia 2,618,659; Serbia and Montenegro 730,669; Norway 351,192.
Limestone, other than dimension		42,917,596	36,339	Slovenia 35,505,328; Germany 4,600,359; Croatia 2,200,000.
Quartz and quartzite	metric tons	68,724	11	Turkey 28,457; Brazil 19,579; Switzerland 13,894.
Sand, other than metal-bearing	do.	1,564,426	448	Egypt 522,707; France 380,356; Spain 200,488.
Sand and gravel	do.	5,543,264	466	Croatia 2,618,662; Serbia and Montenegro 730,669; Egypt 523,030.
Sulfur:				
Elemental:				
Crude including native and byproduct		18,932,041	2,000	Kazakhstan 7,000; Germany 5,221; France 4,563.
Colloidal, precipitated, sublimed		280,970	--	Portugal 218,199; France 45,203; Germany 14,187.
Dioxide		329,768	--	France 326,437; Germany 2,562; Belgium 757.
Sulfuric acid		63,358,580	957	Iran 10,481,183; Austria 8,575,859; Slovenia 7,413,746.
Talc, steatite, soapstone, pyrophyllite	metric tons	128,978	2,189	China 55,608; France 36,674; Austria 12,041.
Vermiculite, perlite, chlorite		68,141,913	39,316	Turkey 49,081,359; Greece 9,364,265; South Africa 6,007,027.
Other, slag and dross, not metal-bearing	metric tons	308,875	--	Turkey 255,943; France 43,598; Austria 3,411.

See footnotes at end of table.

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TABLE 4—Continued
ITALY: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS—Continued				
Asphalt and bitumen, natural	metric tons	244,358	689	Venezuela 242,690; Netherlands 777; United Kingdom 79.
Carbon black		79,318,568	1,562,312	France 15,221,445; Hungary 10,868,703; Russia 8,961,742.
Coal:				
Anthracite	metric tons	338,512	--	Ukraine 184,463; Russia 140,452; China 12,669.
Bituminous	thousand metric tons	14,292	2,791	South Africa 3,001; Australia 2,738; Indonesia 1,950.
Briquets of anthracite and bituminous coal		689,829	--	France 555,687; Germany 97,753; Poland 19,589.
Lignite, including briquets		10,586,322	59,000	Germany 8,435,683; Hungary 887,000; Austria 589,750.
All grades, including briquets	thousand metric tons	25,732	2,852	South Africa 3,001; Indonesia 5,657; Australia 3,122.
Coke and semicoke	metric tons	1,400,168	--	China 806,515; Japan 174,366; Egypt 100,059.
Peat, including briquets and litter	do.	454,198	496	Germany 201,180; Latvia 75,506; Estonia 50,660.
Petroleum:				
Crude	thousand metric tons	87,205	--	Libya 22,388; Russia 18,001; Saudi Arabia 11,874.
Refinery products:				
Liquefied petroleum gas	metric tons	1,817,699	4	France 229,199; Egypt 228,710; Libya 122,495.
Mineral jelly and wax	do.	544,473	736	Indonesia 493,918; Germany 10,929; France 9,919.
Asphalt		45,405,691	--	France 26,498,750; Spain 9,522,640; Belgium 4,296,328.
Bitumen and other residues	metric tons	156,573	--	United Kingdom 106,228; France 26,499; Spain 9,523.
Bituminous mixtures	do.	1,859	491	Belgium 395; Germany 366; United Kingdom 302.
Petroleum coke	do.	3,255,062	2,235,465	Venezuela 945,185; Syria 36,075; Turkmenistan 12,140.

[1]Less than ½ unit.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed August 23, 2006, at URL http://unstats.un.org/unsd/comtrade.

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The Mineral Industry of Malta

By Harold R. Newman

In 2005, Malta remained an important transshipment center in the Mediterranean area. Its political and strategic importance has traditionally emanated from its geographic position in the center of the Mediterranean Sea and its natural deepwater harbor. The transshipment and reexport of goods continued to be significant to the country's economy. International trade and, in particular, export activities represented Malta's economic lifeline. The mineral industry, which consisted mainly of limestone and salt production for domestic consumption, was small (table 1). The mineral-related economy of the country depended mainly on trade and the storage of crude oil. With virtually no natural resources of its own except for its golden limestone (globigerina), Malta depended almost completely on imports of raw materials and fuels.

Malta Freeport offers modern transshipment facilities, which include storage, assembly, and processing operations and an oil terminal with bunkering facilities. Companies licensed to operate within Malta Freeport were exempt from payment of custom tariffs, income tax, and stamp duties on their operations within the port. These incentives were available to both domestic and foreign companies (Malta Freeport Authority, 2005§[1]).

The area of the Maltese archipelago is 316 square kilometers (km^2) and consists of Malta, 246 km^2; Gozo, 67 km^2; and Comino, 3 km^2. The country had a population of almost 400,000. In 2005, Malta's gross domestic product (GDP) based on purchasing power parity was $7.9 billion, and the GDP per capita was $20,015. Inflation was 2.4%, and the real growth rate was 1.5% (International Monetary Fund, 2005§).

Malta entered the European Union (EU) on May 1, 2004, along with nine other countries and became the smallest country in the EU, displacing Luxembourg. Malta entered the European Exchange Mechanism (ERM-2) in May 2005 as a first step to the planned adoption of the single European currency. The Government stated that the decision by the EU to accept Malta into ERM-2 was a vote of confidence in its economic policy. Malta planned to switch its currency from the Maltese lira (Ml) to the EU euro (€) by 2008. Until then, the exchange rate was fixed at Ml0.4293 = €1.0 (Daily News, 2005).

Pancontinental Oil and Gas NL of Australia was continuing with its seismic survey program, which it had initiated in 2004 to investigate Block 3, Area 4 and Area 5 in waters south of Malta. Two large reef prospects were identified in 2005. Anadarko Petroleum Corp. acquired 1385 kilometers of two-dimensional seismic data to detail the Chianti and the Limoncello leads, plus an extended regional grid over the remainder of the permit. Anadarko had an option to earn 65% by drilling and testing one exploration well plus an additional 10% for drilling a second well. Drilling was considered possible as early as 2007 (Pancontinental Oil & Gas NL, 2005a§).

The western and southern boundaries of Area 5 with Tunisia and Libya have not been finalized, so Pancontinental was conducting seismic surveys within undisputed Maltese waters away from those areas. The company was waiting for approval from the Government to begin the surveys, which will be carried out by Anadarko as part of its earnings obligations (Pancontinental Oil & Gas NL, 2005b§).

Outlook

Malta's entrepôt activities in the Mediterranean area are expected to continue along with offshore petroleum exploration.

Reference Cited

Daily News, 2005, Malta sets currency switch target: Daily News [Malta], May 1, p. 1.

Internet References Cited

International Monetary Fund, 2005 (September), Malta, World Economic Outlook Database, accessed June 7, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2005/02/data/dbcoutm.cfm.

Malta Freeport Authority, 2005, Malta, accessed August 22, 2006, at URL http://www.state.gov/e/eb/ifd/2005/43034.htm.

Pancontinental Oil & Gas NL, 2005a, Malta—Executive Summary—Area 5 and block 3, area 4—Southern offshore, accessed February 13, 2006, at URL http://www.pancon.com.au/projects/proj_malta.html.

Pancontinental Oil & Gas NL, 2005b, Malta—Offshore area 5; area 4, block 3, accessed February 13, 2006, at URL http://www.pancon.com.au/reports/quart/311205.pdf.

[1]References that include a section mark (§) are found in the Internet References Cited section.

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TABLE 1

MALTA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Cubic meters)

Commodity[3]	2001	2002	2003	2004	2005
Limestone	1,230,000	1,200,000	1,200,000	1,200,000	1,200,000
Salt	13,000 r	13,000 r	13,000 r	6,000 r	6,000

rRevised.

[1]Estimated data are rounded to no more than three significant digits.

[2]Table includes data available through March 2006.

[3]In addition to listed commodities, small amounts of cement, fertilizer, lime, and plaster are produced, but available information is inadequate to make reliable estimates of output.

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THE MINERAL INDUSTRY OF THE NETHERLANDS

By Harold R. Newman

The Netherlands was an important regional producer of natural gas and petroleum for the European market and played a major role as a transshipment center for mineral materials that entered and left continental Europe. In terms of world production, however, it was a modest producer of metallic and nonmetallic minerals and mineral products.

The Netherlands has a land area of 33,883 square kilometers and borders the North Sea to the north and west, Belgium to the south, and Germany to the east. It is located at the mouths of three major European rivers—the Maas, the Rhine, and the Schelde. The country was one of the most densely populated and topographically low-lying countries in the world. In 2005, the gross domestic product (GDP) based on purchasing power parity was $503 billion, and the per capita income at purchasing power parity was $30,862. The growth rate of the GDP was 1.1% (International Monetary Fund, 2006§[1]).

In 2005, the Dutch economy appeared to be coming out of recession, but the recovery continued to be fragile and unsteady. Production improved, but output was lower than that of 2004 in construction and practically every branch of industry and commercial services. Unemployment rose to 4.9% in 2005 from 4.6% in 2004, and the number of jobs declined for the first time since 1994. The GDP increased slightly because of an increase in overall domestic demand and a 7.2% increase in exports. Imports rose by 6.7%. The Dutch economy was heavily dependent on international developments and could benefit from a strong revival of the world economy. The export, reexport, and import of goods and services together accounted for more than 60% of the GDP (Holland Trade, 2006§).

The raw materials sector was dominated by natural gas and petroleum production, of which about 40% was from offshore. Mining was confined to the extraction of limestone, peat, and sand and gravel by quarrying and solution mining of salt in the east and north of the country. Downstream activities included metallurgical and chemical industries, which were largely based on imported ores and industrial minerals (Mbendi, 2005a§). Since 2001, production of mineral commodities generally remained the same or decreased (table 1).

The Staatstoezicht op de Minjnen (State Supervision of Mines) [SodM], which is an agency within the Ministerie van Economische Zaken (Ministry of Economic Affairs), oversees the production of minerals in the Netherlands and the Netherlands part of the continental shelf. The agency ensures, by regulatory authority, that mineral production is carried out in a responsible manner.

Since the 1980s, the Government has reduced its role in the economy, and privatization has continued with little debate or opposition. Nevertheless, the Government continued to dominate the energy sector and played a large role in the aviation, chemicals, telecommunications, and transportation sectors. The structure of the mineral industry is listed in table 2.

Pechiney Nederland CV (PLN) was a producer of extrusion billets and rolling slabs in aluminum and aluminum alloys made out of primary aluminum and remolten scraps and ingots. With a production capacity of 213,000 metric tons per year (t/yr) of primary aluminum and 230,000 t/yr of billets and slabs, it was one of the leading plants of its kind in Europe. Pechiney Nederland NV, a subsidiary of Alcan Inc. of Canada, owned 85% of PNL. The remaining 15% was owned by the Hunter Douglas Group of the Netherlands. Each partner sells its own share of the production. The Vlissingen location was chosen because of the advantage offered by its deep water access, which facilitated the receipt of raw materials (Pechiney Nederland NV, 2005§).

The merger of Mittal Steel Co. NV with International Steel Group Inc. (ISG) was approved by shareholders in 2005. ISG was one of the leading steel producers in North America. As a result of this merger, Mittal Steel, which has its corporate headquarters in Rotterdam, became, in terms of capacity, the world's largest and most global steel company, with plants in several countries. Mittal Steel, which produced flat and long steel, served most steel-consuming sectors, including the appliance, automotive, construction, and machinery sectors (Mittal Steel Co. NV, 2005§).

Corus Group planned to invest £153 million ($282 million[2]) in a new 1.6-million-metric-ton-per-year (Mt/yr) cold-rolling mill and a new 550,000-t/yr hot-dipped galvanizing line at its Ijmuiden plant. The operations were scheduled to come online in 2008. The investment was expected to expand the product range for both automotive and construction markets. The galvanizing line's output would be 80% dedicated to the automotive sector. Corus sold almost 1 Mt/yr of galvanized steel to the automotive industry in 2005. This number was expected to rise to 1.4 Mt/yr by 2008 (Metal Bulletin, 2005).

Zinifex Limited's zinc smelter at Budel produced a record 231,800 metric tons (t) in 2005 exclusively from zinc concentrates from Zinifex's Century Mine in Queensland, Australia. Work was underway to expand Budel's zinc production to 260,000 t/yr and will include construction of a facility to produce zinc diecast alloy. Commissioning of the facility was planned for mid-2006 (Zinifex Limited, 2006§).

Budel was a state-of-the-art facility that produced very little solid waste. The acidic wastewater from Budel's operation contains zinc and such other metals as chromium, copper, iron, lead, manganese, and nickel. Budel developed a bioprocess that uses sulfate-reducing bacteria to capture and recycle secondary zinc and other metals in its wastewater as metasulfide precipitate. The metasulfide precipitate is recycled back into the refinery feedstock. The process has resulted in a 10- to 40-fold decrease in the concentration of heavy metals in the refinery wastewater and eliminated the production of metal-contaminated gypsum, which was a hazardous waste byproduct (BioEconomy, 2005§).

[1]References that include a section mark (§) are found in the Internet References Cited section.

[2]Where necessary, values have been converted from United Kingdom pounds (£) to U.S. dollars (US$) at the rate of £1.00=US$1.84.

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Nedmag Industries Mining & Manufacturing BV was Europe's leading producer of high-grade synthetic dead-burned magnesia and other magnesium compounds. Four wells near Veendam produced brine saturated with bischofite, which rendered a very high-quality brine that contained less than 1% by weight of nonmagnesium chloride salts and had a density of 1.3 kilograms per liter. The brines were used for the fabrication of dead-burned magnesia, other magnesium compounds, and calcium chloride (Nedmag Industries Mining & Manufacturing BV, 2005§).

Akzo Nobel Salt BV announced that it was seeking a new owner for its salt specialties and solar salt operations. Akzo was intending to merge its base chemical, energy, and salt sectors into one business unit. Akzo stated that it would remain a producer of vacuum salt at its locations in Delfzijl and Hengelo (Akzo Nobel Salt BV, 2005§).

When it came to the supply of energy, the Netherlands was active on the international scene in more than one respect. The country supplied energy to Europe, served as the entrepôt for oil products for the whole of northwestern Europe, and was an advocate for sustainable energy. Onshore natural gas reserves and offshore petroleum and gas reserves in the North Sea have allowed the Netherlands to make a significant contribution to the European energy supply. About 40% of production was from offshore. Nederlandse Aardolie Maatschappij BV (NAM) produced about 75% of the country's total energy, including more than 95% of the onshore production (Mbendi, 2005b§).

NAM put a mobile gas-production facility into use for the first time in the Netherlands. This type of facility is especially well suited for natural gas production from very small fields. It is a mobile modular unit that can be used at one gasfield after another. It was installed initially near the village of Norg in the northern part of the Nederlands (Nederlandse Aardolie Maatschappij BV, 2005§).

Veba Oil Nederland BV had an asset portfolio of equities in 29 onshore and offshore licenses and was the operator of the F2a Hanze oilfield development. The Hanze field was set to become the first oilfield to come into production in the Dutch sector of the North Sea in 10 years. The initial production rate was expected to be about 35,000 barrels per day of oil and would double production in that part of the North Sea (Veba Oil Nederland BV, 2005§).

In July, BP plc officially opened its 9-megawatt (MW) wind farm at its oil terminal in the Port of Amsterdam. The project had the capacity to provide electricity for about 5,000 Dutch homes and to displace 5,000 t of carbon dioxide. The windpark consisted of three wind turbines, each of which was capable of producing 3 MW of electricity; these turbines were the largest to be ordered for the Dutch market. The project was a key part of BP's wind strategy, which focused on placing wind farms on BP land at industrial sites. BP had already applied this formula at its jointly owned 22.5-MW wind farm at the Netherlands Refining Co. near Rotterdam (BP plc, 2005§).

Rotterdam, which was the world's leading container port and a major European transportation hub, remained extremely important as a shipping and storage center. In 2005, 370 million metric tons of cargo passed through the Port of Rotterdam; this was an increase of 5% compared with that of 2004 and a new record (Port of Rotterdam, 2005§).

Outlook

The Port of Rotterdam will continue to be the leading European port and to play a very important role in the European import and export market. Almost as much cargo will pass through Rotterdam as the numbers two, three, and four ports in Europe—Antwerp, Hamburg, and Marseille—combined. A significant percentage of the cargo coming into the port was processed in the port. The Netherlands is expected to continue to be an important exporter of natural gas in the region.

Reference Cited

Metal Bulletin, 2005, Corus targets automotive with Ijmuiden investment: Metal Bulletin, no. 8922, December 5, p. 25.

Internet References Cited

Akzo Nobel Salt BV, 2005, Akzo Nobel intends to merge salt, energy, and base chemicals into one business unit, accessed April 21, 2006, at URL http://www.akzonobelsalt.com/cgi-bin/hotlink.cgi?p=/english/new/news/&h=merge.htm.

BioEconomy, 2005, Mining and metal refining—Budel zinc, accessed May 1, 2006, at URL http://www.bio-economy.net/centre4bis.html.

BP plc, 2005 (January), BP to build wind farm near Amsterdam, accessed May 10, 2005, at URL http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7003869.

Holland Trade, 2006, The Dutch economy, accessed April 26, 2006, via URL http://www.hollandtrade.com/vko/zoeken/ShowBouwsteen_Year.asp.

International Monetary Fund, 2006 (April), Netherlands, World Economic Outlook Database, accessed May 3, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbcoutr.cfm.

Mbendi, 2005a (May), Netherlands—Mining, accessed May 1, 2006, at URL http://www.mbendi.com/indy/ming/eu/nl/p0005.htm.

Mbendi, 2005b (May), Netherlands—Oil and gas, accessed May 1, 2006, at URL http://www.mbendi.com/indy/oilg/eu/nl/p0005.htm.

Mittal Steel Co. NV, 2005, Profile, accessed May 2, 2006, at URL http://www.mittalco.com/Company/Profile.htm.

Nederlandse Aardolie Maatschappij BV, 2005 (July 21), First time in the Netherlands, accessed April 21, 2006, at URL http://www.nam.nl/home/Framework?siteId=nam-en&FC2=nam-en/html.

Nedmag Industries Mining & Manufacturing BV, 2005, Solution mining, accessed June 21, 2006, at URL http://www.nedmag.nl/index.cfm?sid=58&pid=44.

Pechiney Nederlands NV, 2005, The status of PNL, accessed April 21, 2006, at URL http://www.pechineynederland.nl/eng/docs/geschiedenis.htm.

Port of Rotterdam, 2005, Rotterdam continues to do very well, accessed April 25, 2006, at URL http://www.portofrotterdam.com/en/news/pressreleases/2006/Port_of_Rotterdam.asp.

Veba Oil Nederland BV, 2005, SAP solutions, accessed May 21, 2006, at URL http://www.absoft.co.uk/absoft/web/site/CustomerStories.asp.

Zinifex Limited, 2006, Budel smelter, accessed May 21, 2006, at URL http://www.zinifex.com/uploadzinifexpublicdocument/2005.pdf.

Major Sources of Information

Ministry of Economic Affairs
Energy Production Directorate
Bezuidenhoutseweg 6
2594 EC Hague
The Netherlands

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National Geological Survey of the Netherlands
Princetonlaan 6
3508 TA Utrecht
The Netherlands

State Supervision of Mines
Prinses Beatrixiaan 428
2273 XZ Voorburg
The Netherlands

TABLE 1
NETHERLANDS: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2001	2002	2003	2004	2005[e]
METALS						
Aluminum, metal:						
Primary		294,100	284,000	277,900	326,300	330,000
Secondary[e]		120,000	120,000	50,000 [3]	50,000 [e]	50,000
Cadmium, metal, primary		455	485	495	572	575
Iron and steel:						
Ore, sintered, from imports[e]		3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Metal, pig iron, including blast-furnace ferroalloys (if any)		5,305,000	5,000,000 [e]	5,000,000	5,000,000 [e]	5,000,000
Steel:						
Crude		6,037,000	6,117,000	6,587,000	6,848,000	6,919,000 [3]
Semimanufactures[e]		5,335,000 [3]	5,300,000	5,300,000	5,400,000	5,400,000
Lead, metal, refined, secondary[e]		24,400 [3]	22,000	22,000	20,000 [r]	17,000 [3]
Zinc, metal, primary		204,800	203,400	222,700	228,100	231,800 [3]
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	3,400	3,400	3,400	3,400	3,400
Magnesium compounds:[e]						
Chloride		25,000	25,000	25,000	25,000	25,000
Oxide		10,000	10,000	10,000	10,000	10,000
Nitrogen, N content of ammonia	thousand metric tons	1,989	2,053	1,750 [e]	1,970 [e]	1,700
Salt, all types[e]	do.	5,000	5,000	5,000	5,000	5,000
Sand, industrial[e]	do.	15	15	15	15	15
Sodium compounds, n.e.s.:[e]						
Carbonate, synthetic		350,000	350,000	350,000	350,000	350,000
Sulfate:						
Natural		20,000	20,000	20,000	20,000	20,000
Synthetic		15,000	15,000	15,000	15,000	15,000
Sulfur:						
Elemental byproduct:						
Of metallurgy		126,000	124,000	131,000	137,000	135,000
Of petroleum and natural gas		384,000	373,000	408,000	410,000	400,000
Total		510,000	497,000	539,000	547,000	535,000
Sulfuric acid, anhydrous, H_2SO_4[e]		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical[e]		2,300,000	2,300,000	2,300,000	2,200,000	2,200,000
Gas, natural:[e]						
Gross	million cubic meters	74,232 [3]	75,000	75,000	75,000	75,000
Marketed	do.	73,296 [3]	74,000	74,000	74,000	74,000
Natural gas liquids[e]	thousand 42-gallon barrels	160,000	160,000	160,000	160,000	160,000
Petroleum:						
Crude	do.	16,490	16,790	17,000	17,000 [e]	17,000
Refinery products:[e]						
Liquefied petroleum gas	do.	45,990 [r, 3]	54,093 [r, 3]	55,443 [r, 3]	55,000 [r]	55,000
Gasoline, motor	do.	121,874 [r, 3]	133,225 [r, 3]	132,933 [r, 3]	130,000 [r]	130,000
Naphtha and white spirit	do.	90,000	90,000	90,000	90,000	90,000
Kerosene and jet fuel	do.	55,699 [r, 3]	52,451 [r, 3]	56,466 [r, 3]	55,000 [r]	55,000
Refinery fuel and loss	do.	31,865 [r, 3]	25,879 [r, 3]	27,046 [r, 3]	30,000 [r]	30,000
Diesel oil	do.	165,382 [r, 3]	146,073 [r, 3]	155,086 [r, 3]	150,000 [r]	150,000
Residual fuel oil	do.	69,533 [r, 3]	81,979 [r, 3]	79,862 [r, 3]	80,000	80,000
Unspecified	do.	192,684 [r, 3]	161,146 [r, 3]	179,653 [r, 3]	175,000 [r]	175,000
Total	do.	773,000	745,000	776,000	765,000	765,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown.
[1]Table includes data available through May 2006.
[2]In addition to the commodities listed, the Netherlands produced limestone, peat, and construction materials, such as sand and gravel, but output was not reported and no basis exists to make reliable estimates of production.
[3]Reported figure.

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TABLE 2
NETHERLANDS: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facility	Annual capacity
Aluminum:				
Primary		Pechiney Nederland NV (Alcan Inc., 85%)	Plant at Flushing (Vlissingen)	200
Billets		do.	do.	230
Primary		Corus Group	Smelter at Delfzijl	100
Secondary		Alumax Recycling BV	Smelter at Kerkade	50
Cadmium	metric tons	Budel Zinc BV (Ziniflex Ltd.)	Plant at Budel-Dorplein	650
Cement		Eerste Nederlandse Cement Industrie NV	Ten plants at Maastrict	2,700
Do.		Cementfabriek IJmuiden BV	Three plants at Ijmuiden	1,600
Do.		Cementfabriek Rozenburg BV	Two plants at Rozenburg	920
Lead		Hollandse Metallurgische Industrie Billiton BV	Electrolytic plant at Arnhem	35
Do.		Billiton Witmetaal BV	Electrolytic plant at Naarden	6
Limestone		Ankerpoort NV (Lhoist SA, 100%)	Mines at Maastricht and Winterswijk	600
Magnesia		Nedmag Industries Mining & Manufacturing BV	Plant at Veendam	130
Do.		MAF Magnesite BV	Plant at Schiedam	40
Natural gas	million cubic meters per day	Nederlandse Aardolie Maatschappij BV (NAM)	Groningen, Leeuwarden, Assen, and other onshore gasfields and several offshore wells in the North Sea	225
Petroleum:				
Crude	42-gallon barrels per day	Amoco Inc., Conoco Inc., and Unocal Inc.	766 wells (204 producing) including North Sea fields: Haven, Helder, Helm, Hoorn, Kotter, Logger, and Rijn	83,500
Do.	do.	Nederlandse Aardolie Maatschappij BV (NAM) (ExxonMobil Corp., 50%)	Onshore fields: Berkel, DeLier, Ijselmonde, Meerkapelle, Pernis, Pinacke, Rotterdam, Schoonebeck, West, Werkendam, and Zoetemeer	20,500
Do.	do.	Veba Oil and Gas Netherlands	Hanze field, North Sea	31,500
Refined		Six companies, of which the major ones are:	Refineries	1,230,500
			Of which:	
		Netherlands Refining Co. (BP plc, 69%, and ChevronTexaco, 31%)	Rotterdam	(446,000)
		Shell Nederland Raffinaderij BV	Pernis	(374,000)
		Esso Nederland BV	Rotterdam	(175,000)
		Total Raffinaderij Nederland NV	Vlissingen	(150,000)
Salt		Akzo Nobel Salt BV (Akzo Nobel BV, 100%)	Mines	4,100
			Of which:	
			Hengelo	(2,100)
			Delfzijl	(2,000)
Sand, silica		Sigrano Nederland NV (Sibelco Group)	Mines and plants at Heerlin and Maastricht	500
Do.		Lieben Minërals BV	Mines at South Limburg	150
Sodium:				
Carbonate, synthetic		Brunner Mond Group	Plant at Delfzijl	380
Sulfate, synthetic		do.	do.	600
Steel		Corus Group	Plant at Ijmuiden	7,000
Zinc		Budel Zinc BV (Ziniflex Ltd.)	Plant at Budel-Dorplein	232

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THE MINERAL INDUSTRY OF NORWAY

By Chin S. Kuo

Norway's gross domestic product (GDP) growth was 2.3% owing to the Government's stimulative fiscal policy and to economic recovery in Europe and the United States. The country was one of the world's richest countries in terms of the per capita GDP based on purchasing power parity, which in 2005, was $42,364. Inflation remained low at 1.6% (International Monetary Fund, 2006§[1]). The most important industries were chemicals, fishing, metals, pulp and paper products, and shipbuilding. The mining and quarrying sector accounted for mine production of feldspar, graphite, ilmenite, iron ore, and limestone. Norway also was a mineral processor of aluminum, cadmium, cobalt, copper, ferroalloys, nickel, and zinc. Platinum-group metals were recovered from imported nickel and copper concentrates. However, the petroleum sector contributed significantly to Norway's economic vitality. The country's oil production capacity was more than 3 million barrels per day.

Norway was the third ranked oil exporter and the seventh ranked gas exporter in the world. It provided much of Western Europe's oil and gas requirements, particularly those of France, Germany, and the United Kingdom. The Government reported that despite a low resource replacement rate and a market perception of Norway's mature oil and gas provinces, the best potential large finds were in the Barents Sea, in deep water zones in the Norwegian Sea, and on acreage around Lofoten Island in northern Norway. The first two would be the focus of the 19th licensing round, which was scheduled for June 2005. Statoil ASA estimated that the Norwegian side of the Barents Sea held about 8 billion barrels of oil equivalent. The Norwegian North Sea also was underexplored. Of two possible discoveries in 2005—the Royal Dutch/Shell Group's gas condensate find at its President license and Norsk Hydro A/S's Obelix oil find in the Barents Sea—the latter oil find proved to be disappointing according to the company's 2005 annual report (Alexander's Gas & Oil Connections, 2005§).

Commodity Review

Metals

Norsk Hydro, which was the country's major aluminum producer, planned to close the Soderberg potlines at its Hoyanger plant in Norway by the first quarter of 2006. The closure of the production lines would affect 90 employees. Hoyanger would have a production capacity of 55,000 metric tons per year (t/yr) of primary aluminum after the closure. Norsk Hydro was involved in business development programs at Hoyanger to mitigate the impact of lost jobs. At Sunndal, production of primary aluminum increased in 2005 owing to an expansion project (Norsk Hydro A/S, 2005).

AS Sydvaranger's shuttered Bjornevatn iron ore mine in northern Norway was put up for sale. Varanger Kraft owned a 67% interest in Sydvaranger and Sor Varanger held the remaining 33%. The mine, which was closed in 1997, had been producing 1.5 million metric tons per year (Mt/yr) of pellet up to that time. The company's deepwater icefree port at Kirkenes was capable of taking vessels of up to 125,000 dead weight tons and was connected to the mine via an 8-kilometer (km)-long rail link (Metal Bulletin, 2005).

Crew Minerals AS was granted the exclusive title for two porphyry molybdenum properties at Hurdal and Skrukkelia in the Oslo region. The Hurdal project was the largest molybdenite deposit in Europe. At Hurdal, some 9,000-meter drillings from 24 holes outlined a deposit that has a preliminary resource estimate of 200 million metric tons at an average grade of 0.2% MoS_2. According to the company, the deposit was strikingly similar to the Climax and the Henderson molybdenum deposits in the United States (Crew Gold Corp., 2005).

Blackstone Ventures Inc. of Canada reported that its geophysical survey of the Espedalen property in south-central Norway demonstrated that the Stormyra electromagnetic conductor for nickel exceeded 1 km in length. Followup diamond drillings consisting of 17 holes on the nickel conductor began in March 2005. Blackstone earned a 60% interest in the property from Sulfidmalm A/S, which was a wholly owned subsidiary of Falconbridge Ltd. of Canada. Falconbridge was to spend $5 million to earn an additional 20% interest in the project following exercise of the backin right (Blackstone Ventures Inc., 2005).

Blackstone and Sulfidmalm entered into a joint-venture agreement to explore five large nickel-copper-cobalt project areas in southern Norway at Bamble, Ertelien, Evje, Hosanger, and Skjaekerdalen; combined, the areas covered approximately 23,400 square kilometers. Nickel sulfide mineralization would be the focus of the exploration program. Blackstone had the right to earn a 50% interest in the five properties by incurring exploration expenditures of at least $3.5 million by the end of 2006 and at least $1.2 million in each of the subsequent calendar years (Falconbridge Ltd., 2005§).

Industrial Minerals

SMA Magnesium AS was owned by SMA Svenska Mineral AB, which was one of the leading producers in Scandinavia of lime/dolomitic lime for the environmental, paper, steel, and other markets. SMA Magnesium's seawater process at the Porsgrunn plant used marble, limestone, and dolomite or dolomitic limestone to produce magnesia. A dolomite calcination project for dolime manufacture was being constructed and was due for completion by the end of 2005. Production capacity was 15,000 t/yr of magnesia, including magnesium hydroxide (Industrial Minerals, 2005).

[1]References that include a section mark (§) are found in the Internet References Cited section.

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Mineral Fuels

Offshore exploration drilling picked up considerably in 2005 and the Barents Sea began to see more drilling activity. Hydro Norsk planned to upgrade the Oseberg East platform and to drill seven new wells. Norsk Hydro also proposed to produce from the 50-billion-barrel Vilje oilfield through Marathon Oil Corp.'s Alvheim floating production, storage, and offloading unit. Statoil planned to raise new reserves from satellites of its Gullfaks Field in the North Sea. Statoil also was to use a jackup to produce its Volve Field in the southern Viking Graben area between Heimdal and Sleipner (Offshore, 2005).

Norske Shell made a significant discovery of gas in Jurassic sandstones in the Onyx South West prospect in the Norwegian Sea. Two zones were tested; each flowed at a maximum rate of 1.4 million cubic meters per day. Shareholders in production license 225 were A/S Norske Shell (30%), Petoro AS (30%), Statoil (20%), and Total E&P Norge AS (20%). Norsk Hydro made an oil discovery north of Fram in May 2005. The well tested 3.2 barrels per day. The company was considering development of the find using Fram and Troll C infrastructure (Petroleum Economist, 2005a).

The Statoil-led group's Statfjord Field was to go ahead with the late-life development. The group would spend $2.4 billion to recover an additional 25 million barrels of oil and 32 billion cubic meters of gas. An additional $248 million would be spent on constructing a new pipeline to allow gas from the Norwegian part of the Anglo-Norwegian Field to flow into the United Kingdom's Far North Liquids and Gas System (Flags) Pipeline. Gas exports from the Norwegian part would start in October 2007. Owners' interests were Statoil (44.34%), ExxonMobil Corp. (21.37%), ConocoPhillips (10.33%), Shell (9.44%), ConocoPhillips (United Kingdom) (4.84%), BP (United Kingdom) (4.84%), and Centrica (United Kingdom) (4.84%) (Petroleum Economist, 2005b).

Statoil expected a network of gas pipelines to be built that would connect the Russian and Norwegian Barents Sea to continental Europe. One or two pipelines would first be built to connect the western Barents Sea gas finds to Europe through the Ormen Lange/Langeled system or the Aasgard network. The Barents Sea was estimated to hold about 40 billion barrels of oil equivalent. Gazprom's 3.2 trillion-cubic-meter Shtokman natural gas field in the Russian Barents Sea would be developed and piped in the later phases. Pipelines to connect Shtokman gas to the Norwegian Barents Sea pipe network were foreseen. European natural gas demand was projected to rise to about 750 billion cubic meters per year by 2020 from 500 billion cubic meters per year in 2005 (Rigzone.com, 2005§).

A liquefied natural gas (LNG) project was under construction at Snohvit (Melkoya Island) by Statoil and was expected to start up in 2006. The plant with one train would have a capacity of 4.2 Mt/yr of LNG, which was to be exported to Spain and the United States (Petroleum Economist, 2004).

Infrastructure

Hydropower provided nearly all Norway's electricity; Naturkraft AS, however, planned to build a $333 million 420-megawatt onshore gas-fired powerplant at Karsto in Rogaland, western Norway. The plant would have a filtering system for nitrogen oxides emissions and possibly a gas scrubbing facility for carbon dioxide emissions. It would deliver up to 3.5 terawatt hours per year to the Norwegian power grid. The plant was expected to start electricity production in the fall of 2007. Naturkraft was owned by Norsk Hydro and Statkraft AS (50% each) (Naturkraft AS, 2005).

References Cited

Blackstone Ventures Inc., 2005, UTEM geophysical survey confirms +1 km strike length of high-grade nickel conductor: Vancouver, British Columbia, Canada, Blackstone Ventures Inc. news release, February 28, 1 p.

Crew Gold Corp., 2005, Hurdal molybdenite project acquired by Crew: London, United Kingdom, Crew Gold Corp. news release, January 13, 2 p.

Industrial Minerals, 2005, SMA Magnesium: Industrial Minerals, no. 458, November, p. 76.

Metal Bulletin, 2005, Sydvaranger puts shuttered Norwegian iron ore mine up for sale; Metal Bulletin, no. 8900, July 4, p. 17.

Naturkraft AS, 2005, Naturkraft builds gas power plant at Karsto: Tysvaervag, Norway, Naturkraft AS press release, June 24, 2 p.

Norsk Hydro A/S, 2005, Hydro to restructure aluminum plants facing increasing power costs: Oslo, Norway, Norsk Hydro A/S press release, June 16, 3 p.

Offshore, 2005, Exploration drilling picking up: Offshore, v. 65, no. 5, May, p. 34.

Petroleum Economist, 2004, Using all the options: Petroleum Economist, v. 71, no. 5, May, p. 17.

Petroleum Economist, 2005a, News in brief: Petroleum Economist, v. 72, no. 6, June, p. 46.

Petroleum Economist, 2005b, Statfjord late-life project to set recovery record: Petroleum Economist, v. 72, no. 4, April, p. 23.

Internet References Cited

Alexander's Gas & Oil Connections, 2005 (March 15), Norway sees potential of big oil and gas finds on Norway Shelf, accessed April 11, 2005, at URL http://www.gasandoil.com/goc/news/nte51478.htm.

Falconbridge Ltd., 2005 (September 7), Falconbridge and Blackstone expand Norway nickel search, accessed September 27, 2005, at URL http://www2.ccnmatthews.com/scipts/dnrp/release.asp?d=/cnrpxml/2005/9/7/285804.

International Monetary Fund, 2006 (April), Norway, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

Rigzone.com, 2005, Statoil sees Barents gas pipe network into Europe by 2020, accessed April 22, 2005, at URL http://www.rigzone.com/news/article.asp?a_id=21989.

Major Sources of Information

Ministry of Petroleum and Energy
P.O. Box 8148 Dep
0033 Oslo, Norway
Norwegian Geological Survey
P.O. Box 3006 Lade
7002 Trondheim, Norway

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TABLE 1
NORWAY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Primary	metric tons	1,067,600	1,095,500	1,192,400	1,321,700	1,376,500
Secondary	do.	223,900	271,000	256,800	348,700	362,400
Cadmium, smelter	do.	372	209	331	260	260
Cobalt:						
Mine output, Co content[e]	do.	100	100	--	--	--
Metal, refined	do.	3,314	3,994	4,556	4,670	5,021
Copper, metal, refined, primary and secondary	do.	26,700	30,500	35,900	35,600	38,500
Iron and steel:						
Iron ore and concentrate, Fe content		340 [e]	350 [e]	340	408	420 [e]
Metal:						
Pig iron[e]		60	80	90	90	90
Ferroalloys:[e]						
Ferrochromium		83 [2]	61 [2]	-- [2]	-- [2]	-- [2]
Ferromanganese		240	240	245	245	250
Ferrosilicomanganese		230	230	230	230	230
Ferrosilicon, 75% basis		450	390	350	300	270
Silicon metal		100	105	100	105	105
Other		15	15	15	15	15
Total		1,120	1,040	940	900	870
Steel, crude		635	694	698	695	690 [e]
Semimanufactures, rolled[e]		623 [2]	630	635	640	650
Magnesium, primary	metric tons	36,000 [e]	10,000 [e]	--	--	--
Nickel:						
Mine output:						
Concentrate[e]	do.	18,000	12,000	--	--	--
Ni content	do.	2,529	2,052 [r]	169 [r]	181 [r]	150
Metal, primary	do.	68,220	68,500	77,200	71,400	84,900
Platinum-group metals[3]	kilograms	15,600 [r]	15,600 [r]	-- [r]	-- [r]	--
Titanium:[e]						
Ilmenite concentrate		750	750	840 [2]	860	860
TiO_2 content		340	340	378 [2]	387	388
Zinc, metal, primary	metric tons	129,300	137,300	143,500 [r]	140,900 [r]	133,300
INDUSTRIAL MINERALS						
Cement, hydraulic[e]		1,870	1,850	1,860	1,870	1,900
Feldspar[e]	metric tons	73,000	75,000	74,000	75,000	88,690 [2]
Graphite[e]	do.	2,500	2,400	2,400	2,300	8,893 [2]
Lime, hydrated, quicklime[e]		100	100	100	100	100
Mica, flake[e]	metric tons	2,500	2,600	2,600	2,600	2,700
Nepheline, syenite[e]		310	310	300	300	300
Nitrogen, N content of ammonia		323	330	354	420	450
Olivine sand[e]		3,300	3,200	3,100	3,100	3,100
Stone, crushed:[e]						
Dolomite		900	900	850	850	513 [2]
Limestone		7,500	7,400	7,200	7,300	7,200
Quartz and quartzite		1,500	1,400	1,500	1,500	909 [2]
Sulfur, byproduct:						
Metallurgical		105	102	100	85 [r]	80
Petroleum[e]		18	19	20	18 [r]	20
Total[e]		123	121	120	103 [r]	100
Talc, soapstone, steatite[e]		27	28	28	28	26 [2]

See footnotes at end of table.

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TABLE 1--Continued
NORWAY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades[e]		320	310	300	300	300
Gas, natural, marketed[4]	million cubic meters	53,895	65,501	73,124	78,465	84,964
Peat, for agricultural use[e]	do.	30	30	30	30	30
Petroleum:						
Crude[5]	thousand 42-gallon barrels	1,138,400	1,092,800	1,041,400	1,024,400	964,290
Natural gas liquids[e]	do.	41,000	41,000	42,000	52,695 [r, 2]	60,879 [2]
Refinery products:[e]						
Naphtha	do.	27,000	27,000	27,000	8,741 [r, 2]	10,017 [2]
Gasoline	do.	26,000	26,000	27,000	23,913 [r, 2]	28,078 [2]
Kerosene	do.	9,000	9,000	9,000	4,774 [r, 2]	5,771 [2]
Distillate fuel oil	do.	46,000	46,000	47,000	45,765 [r, 2]	50,121 [2]
Residual fuel oil	do.	12,000	12,000	12,000	13,823 [r, 2]	11,806 [2]
Other products	do.	4,500	5,000	5,000	3,351 [r, 2]	4,194 [2]
Refinery fuel and losses	do.	4,000	5,000	5,000	2,757 [r, 2]	2,977 [2]
Total	do.	129,000	130,000	132,000	103,124	112,964

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.
[1]Table includes data available through August 31, 2006.
[2]Reported figure.
[3]Data represent exports.
[4]Reported as total methane sales.
[5]Excluding natural gas liquids.

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TABLE 2
NORWAY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	Hydro Aluminium ANS (Norsk Hydro A/S, 70%)	Smelters at Ardal, Hoyanger, Karmoy, and Sunndal	600
Do.	do.	Plant at Holmestrand	90
Do.	Elkem Aluminium ANS (Elkem A/S, 50%, and Alcoa Inc., 50%)	Smelters at Farsund and Mosjoen	250
Do.	Sor-Norge Aluminium A/S (Alusuisse Group, 50%, and Hydro Aluminium ANS, 49%)	Smelter at Odda	50
Cadmium	Norzink A/S (Outokumpu Oyj, 100%)	Smelter at Eitrheimsneset	0.3
Cement	Norcem A/S	Plants at Brevik and Kjopsvik	2,150
Coal	Store Norske Spitsbergen Kulkompani A/S	Mines at Longyearbyen and Svea	450
Cobalt	Nikkelverk A/S (Falconbridge Nickel Mines Ltd., 100%)	Smelter at Kristiansand	5
Copper:			
Ore, Cu content	Nikkel og Olivin A/S (Outokumpu Oyj, 100%)	Mine at Narvik	1
Metal	Nikkelverk A/S (Falconbridge Nickel Ltd., 100%)	Smelter at Kristiansand	40
Dolomite	Franzefoss Bruk A/S	Mine at Ballagen	350
Do.	Norwegian Holding A/S	Mines at Hammerfall, Logavlen, and Kvitblikk	500
Feldspar	Franzefoss Bruk A/S	Mine at Lillesand	100
Ferroalloys	Elkem Salten (Elkem A/S, 100%)	Ferrosilicon plant at Straumen	90
Do.	Elkem Bjolvefossen (Elkem A/S, 100%)	Ferrosilicon plant at Alvik	60
Do.	Elkem Thamshavn (Elkem A/S, 100%)	Ferrosilicon plant at Orkanger	60
Do.	Finnfjord Smelteverk A/S, Rana Metal (FESIL ASA, 100%)	Ferrosilicon plant at Mo i Rana	110
Do.	A/S Hafslung Metal (FESIL ASA,100%)	Ferrosilicon plant at Sarpsborg	75
Do.	Ila og Lilleby Smelteverk (FESIL ASA, 100%)	Ferrosilicon plant at Finnsnes	20
Do.	Oye Smelteverk (Tinfos Jernverk A/S, 100%)	Silicomanganese plant at Kvinesdal	235
Iron, metal	Ulstein Jernstoperi A/S	Hordvikneset	10
Iron ore	Rana Gruber A/S (Norsk Jernverk Holding A/S, 100%)	Mine at Mo i Rana	2,000
Do.	Arctic Bulk Minerals A/S	Mine and plant at Kirkenes	1,500
Lime	Hylla Kalkverk (Nikolai Bruch A/S, 100%)	Verdal/Trondheim Mine and plant	80
Do.	A/S Norsk Jernverk	Plant at Mo i Rana	48
Do.	Ardal og Sunndal Verk A/S	More og Romsdal Mine at Surnadal	20
Do.	Breivik Kalkverk A/S	Alesund Mine at Larsnes	20
Do.	Mjoendalen Kalkfabrik	Plant at Asen/Drammen	7
Limestone	Norcem A/S	Dalen, Bjorntvedt, and Kjopsvik Mines	1,600
Do.	Vardelskalk A/S (Franzefoss Burk A/S, 100%)	Sandvika Mine	800
Do.	Breivik Kalkverk A/S	Visnes and Glaerum Mines	500
Magnesium	Norsk Hydro A/S (Government, 51%)	Plants at Porsgrunn and Sauda	50
Manganese, alloys	Eramet SA	do.	500
Natural gas million cubic meters	Statoil ASA	Gama, Gullfaks, Sleipner Ost, and Statfjord Fields	12,270
Do. do.	Phillips Petroleum Company Norway	Ekofisk Field	9,900
Do. do.	Elf Petroleum Norge A/S	Frigg, Heimdal, and Ost-Frigg Fields	5,750
Do. do.	Norsk Hydro Produksjon A/S	Troll-Oseberg Field	2,600
Do. do.	Statoil ASA	Mikkel Field	2,100
Do. do.	Total, 40%; Petoro, 30%; Marathon Petroleum Norge AS, 20%; Norsk Hydro Produksjon A/S, 10%	Skirne Field	1,550
Do. do.	BP Petroleum Development of Norway	Gyda and Ula Fields	1,040
Do. do.	Esso Norge A/S	Odin Field	1,000
Do. do.	Amoco Norway A/S	Hod and Valhall Fields	910
Nepheline syenite	North Cape Mineral A/S (Unimin Corp., 84%)	Mine at Stjernoy	350
Nickel:			
Ore, Ni content	Nikkel og Olivin A/S (Outokumpu Oyj, 100%)	Mine at Narvik	3
Do.	Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	0.5
Metal	Nikkelverk A/S (Falconbridge Nickel Mines Ltd., 100%)	Smelter at Kristiansand	85
Olivine	A/S Olivin	Aheim Mine and plant	2,500
Do.	do.	Stranda Mine and plant	300
Do.	Franzefoss Bruk A/S	Lefdal Mine at Bryggja	500

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TABLE 2--Continued
NORWAY: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum	42-gallon barrels per day	Statoil ASA	Gullfaks, Statfjord, Tommeliten, and Veslefrikk Fields	1,069,300
Do.	do.	Norsk Hydro Produksjon A/S	Brage, Mime, and Oseberg Fields	566,200
Do.	do.	Phillips Petroleum Company Norway	Ekofisk Field	237,500
Do.	do.	Saga Petroleum A/S	Snorre Field	170,000
Do.	do.	BP Petroleum Development of Norway	Gyda and Ula Fields	155,000
Do.	do.	A/S Norske Shell	Draugen Field	90,000
Do.	do.	ExxonMobil Refining & Supply Co.	Slagen Refinery	110,000
Do.	do.	Statoil Mongstad	Mongstad Refinery	200,000
Pyrite		Folldal Verk A/S (Norsulfid A/S, 100%)	Mine at Hjerkinn	10
Quartzite		Elkem Tana (Elkem A/S, 100%)	Mine at Tana	540
Do.		Elkem Marnes (Elkem A/S, 100%)	Mine at Sandhornoy	200
Do.		Vatnet Kvarts A/S	Mine at Nordland	150
Do.		Snekkevik Kvartsbrudd	Mine at Kragero	110
Silicon metal		Lilleby Metall A/S (FESIL ASA, 100%)	Plant at Trondheim	9
Do.		FESIL ASA	Plant at Holla	50
Steel		Fundia AB (Norsk Jenverk, 50%, and Rautaruukki Group, 50%)	Plants at Christiania, Mandal Stal, Mo i Rana, and Spigerverk	600
Talc		A/S Norwegian Talc (Pluess-Staufer AG, 51%)	Mine and plant at Altermark/Knarrevik and Framfjord	90
Do.		Kvam Minerals A/S	Mine and plant at Kvam	6
Titanium, concentrate		Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	800
Zinc, metal		Norzik A/S (Outokumpu Oyj, 100%)	Smelter at Odda	150

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THE MINERAL INDUSTRY OF PORTUGAL

By Harold R. Newman

The southern Iberian Peninsula, which is known as the Iberian Pyrite Belt (IPB), is one of the most mineralized areas of Western Europe and is geologically complex. Massive sulfides linked to synorogenic volcanism were deposited in the southwestern part of the peninsula. The IPB's volcanogenic massive sulfide (VMS) deposits, which date to the Upper Devonian and the Lower Carboniferous ages, were deposited during submarine felsic volcanism. The IPB, with 85 known VMS deposits, was the main source of base metals in the European Union (EU). The country has considerable mineral wealth; the most important metallic mineral resources are copper, tin, and tungsten. Large reserves of uranium also exist, although they were not exploited. The most important mineral resources include such nonmetallic ores as high-quality marble, pyrites, and rock salt. Portugal also has an abundance of waterpower resources.

Portugal has a land area of 92,390 square kilometers (km^2), which includes the Azores and the Madeira Islands, and is bordered on the east and north by Spain and on the south and west by the Atlantic Ocean. The country is a republic divided into 18 districts for administrative purposes. In 2005, the gross domestic product based on purchasing power parity was $203 billion, and the per capita income based on purchasing power parity was $19,335. The inflation rate was 2.1%, and the unemployment rate was more than 7.6% (International Monetary Fund, 2006§[1]).

Although the mineral industry of Portugal was modest in size, it was one of the leading producers of mined copper in the EU. The country was also an important producer of dimension stone and tungsten concentrates (table 1).

EuroZinc Mining Corp. mined copper with tin as a byproduct at its Neves-Corvo Mine, and Beralt Tin & Wolfram S.A. mined tungsten at its Panasqueira Mine; these were the two major operations in the metals mining sector. Lusosider Aços Planos S.A. and SN Servicos S.A. were the major steel producers. Cimentos de Portugal S.A. (Cimpor) was an important producer of cement. With the exception of copper, dimension stone, and tungsten, production of other minerals and related materials had only domestic significance. Some of the leading mineral-related companies were partially owned or controlled by the Government, and some operations were privately owned (table 2).

Portugal's economy has become diversified and increasingly service-based since the country joined the EU. The Government continued with the country's privatization program and was proceeding with legislation that would privatize many state-owned companies. The privatization effort was part of a broader program to reduce the role of the state and to encourage the economy to be more market driven. Portugal has been overshadowed by lower-cost producers in Central Europe and Asia as a target for foreign direct investment (U.S. Central Intelligence Agency, 2006§).

Redcorp Ventures Ltd. signed an agreement on November 3, 2004, with the Government to acquire the Lagoa Salgada exploration contract. The 415-km^2 Lagoa Salgada property consisted of advanced drill-stage polymetallic VMS exploration targets in the northwestern end of the IPB. In July 2005, Redcorp commenced a diamond drilling program after completion of pre-collar drilling and casing of the Tertiary sediments, which overlie the host bedrock, to allow coring and evaluation of the exploration targets. Diamond drilling by previous owners on the concession resulted in the discovery of a VMS deposit hosted within a series of intensely hydrothermally-altered volcanic rocks. These rocks lie on an extension of the volcanic stratigraphy that hosts the Caveira and the Lousal VMS deposits to the south and the Neves-Corvo VMS deposit to the east (Redcorp Ventures Ltd., 2005b§).

Between August and December 2005, Redcorp completed a six-hole 2,000-meter (m) drill program to evaluate several density anomalies. The work was only partially successful because three of the holes were unable to be completely tested owing to problems with completing the holes. Copper, gold, lead, silver, and zinc occurrences were encountered in the massive sulfide deposit. Further drilling was planned in 2006 to complete the evaluation of the target area and assess other prospective zones (Redcorp Ventures Ltd., 2005a§).

EuroZinc Mining Corp. was a Canadian-based mining company that owned two base metal mines in southern Portugal. The Neves-Corvo Mine was operating and was a significant producer of copper concentrates. The Aljustrel Mine, which is situated 40 kilometers (km) from Neves-Corvo, was on care and maintenance status.

EuroZinc announced that it had completed the purchase of 100% of the shares of Sociedade Mineira Neves-Corvo SA (SOMINCOR). The shares were purchased from Empressa de Desenvolvimento SA (51%) of Portugal and the Rio Tinto Group (49%) of the United Kingdom for a purchase price of about $155 million. The Neves-Corvo Mine was one of the highest grade copper mines in the world. Neves-Corvo consisted of five ore bodies that contain copper, tin, and zinc. In 2006, zinc production will start and supplant tin production, as there were insufficient tin reserves remaining in the deposits to support full-time production. The mine had estimated proven copper reserves of 6,835 million metric tons (Mt) at an average grade of 5.73%, and estimated probable copper reserves of 9,975 Mt at an average grade of 5.29%, and estimated probable zinc reserves of 10,626 Mt at an average grade of 7.96% (EuroZinc Mining Corp., 2005§).

EuroZinc reported that drilling continued to intersect high grade copper and zinc zones at Zambujal. The Zambujal ore body was one of five polymetallic massive sulfide ore bodies that make up the Neves-Corvo area. Underground infield drilling identified a thick and high-grade polymetallic zone

[1]References that include a section mark (§) are found in the Internet References Cited section.

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that averaged 21 m in thickness at grades of 13.1% copper and 7.6% zinc. Of the 46,000 m of drilling planned in the program, 3,000 m was completed in 2005, and the balance was scheduled for 2006 (MBendi Information Services (Pty) Ltd., 2005b§).

C2C Inc. of Canada announced that it had optioned the Penedono gold project from Rio Narcea Gold Mines. The property has a surface area of 220 km^2 where about €1.5 million ($1.9 million[2]) worth of exploration work was completed between 1998 and 2004 with several gold occurrences revealed. The auriferous occurrences were generally associated with structural zones that consist of faults, shears, fractures, and deformation corridors with conjugate networks that would facilitate the controls of the mineralization. Diamond drilling started in early 2005 (MBendi Information Services (Pty) Ltd., 2005a§).

Iberian Resources reported that their drilling program had intersected high-grade gold mineralization in shallow depths at the Montemor gold project. Mineralization occurred from 16.1 m to 25.1 m with an average grade of 10.1 grams per metric ton (g/t) of gold. Montemor was reported to contain an inferred resource of 4.12 Mt at a grade of 2.74 g/t gold. The resource was contained in a series of 11 shallow deposits along a 12-km shear zone. Limited drilling had been done between the existing deposits or at depths of greater than 100 m. Iberian believed that there was potential to expand on the existing resource base with additional exploration drilling (MBendi Information Services (Pty) Ltd., 2005c§).

Beralt Tin & Wolfram SA (Beralt), which was owned by Primary Metals Inc. of Canada, operated the Panasqueira Mine in Beira Baixa Province. The mine was one of the world's leading producers of tungsten concentrates outside of China and produced a 75% tungsten oxide (WO_3) concentrate. Beralt announced that there was progress at the mine where new underground equipment was introduced and a refurbishment program was underway (Primary Metals Inc., 2006§).

Portugal's industrial minerals sector was a modern and efficient producer of a variety of materials, most notably dimension stone and minerals for the manufacture of ceramics. The dimension stone industry continued to be an important segment of the mining industry in terms of value and trade.

Cimpor was Portugal's leading cement manufacturer and was the number two cement company on the Iberian Peninsula after Cemex SA. In addition to cement, Cimpor also produced aggregates, precast concrete products, and dry mortars. The development of Portugal's infrastructure was expected to create a substantial demand for Cimpor's products in the coming years (Hoover's, Inc., 2006§).

Marble was the most valuable of the stone products and accounted for the majority of stone production. The main area for marble quarrying continued to be the Evora District.

Although Portugal was one of the faster growing European economies, it had limited domestic energy resources and imported about 90% of its oil needs. The leading suppliers were Russia, Libya, and Saudi Arabia. Portugal imported small amounts of coal for electricity generation, which produced about 5% of the country's needs. One-third of Portugal's electricity was provided by hydropower. The energy sector was expected to become increasingly more dependent upon and integrated with Spain's energy sector (U.S. Energy Information Administration, 2006§).

The leading oil company was Petroleos de Portugal (Petrogal),which was a subsidiary of Government-owned Galp Energia SGPS, S.A. Petrogalp controlled the domestic midstream and downstream oil sectors. The Government announced that it planned to offer part of its 30% stake in Galph Energia in a public offering in 2006 (U.S. Energy Information Administration, 2006§).

The Government signed an agreement with Argus Resources of the United Kingdom to build a petroleum refinery that would be the largest, in terms of production capacity, on the Iberian Peninsula. The project will be built 90 km south of Lisbon at Sines. The refinery, which was to be completed by 2010, was expected to cost $4.7 billion and would have a production capacity of 250,000 barrels per day. More than one-half of the output was to be exported to the United States (Petroleum Economist, 2006).

The EU Executive Commission blocked a proposed merger of Portugal's main electricity and gas groups because of objections raised by EU competition authorities. The transaction would have allowed Galp Energia to sell 51% of Gás de Portugal to Energia de Portugal and to sell the remaining 49% to ENI SpA of Italy (Alexander's Gas & Oil Connections, 2006§).

Outlook

The structure of the mineral industry could change in the near future because of continuing mineral exploration based on exploration models developed in the IPB. Copper, gold, kaolin, lithium, and pyrites were some of the minerals targeted for exploration. The IPB is a focus of interest for mining companies as well as for official institutions in Portugal and Spain and is a prime area for exploration activity; the IPB appears to have an above-average potential for success on the basis of the large VMS deposits discovered to date. Companies will be targeting the Portugal area of the IPB, which is considered to be underexplored. EuroZinc's copper-zinc exploration and mining operations reside in Portugal where the company plans to embark on a $10 million 18-month exploration program to explore the area near its existing Neves-Corvo Mine. Redcorp Ventures Ltd. is exploring for copper, lead, silver, and zinc at its Lagoa Salgada property. Increased production of granite, marble, and slate in Portugal is also possible.

Reference Cited

Petroleum Economist, 2006, Portugal: Petroleum Economist, volume 73, no. 2, February, p. 43.

Internet References Cited

Alexander's Gas & Oil Connections, 2006 (January 19), Portugal to invest EUR 3.6 bn in renewable energy, accessed February 27, 2006, via URL http://www.gasandoil.com.

[2]Where necessary, values have been converted from European Union euros (€) to U.S. dollars (US$) at the rate of €1.00=US$1.27.

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EuroZinc Mining Corp., 2005 (May 13), Eurozinc Mining Corp. completes purchase of Neves Corvo copper mine, accessed March 9, 2006, at URL http://www.investorcalendar.com/includes/PRNPressRelease.asp.
Hoover's, Inc., 2006, Cimentos de Portugal S.A., accessed June 27, 2006, at URL http://www.hoovers.com/cimpor/--ID_106430--/freeuk-co-factsheet.xhtml.
International Monetary Fund, 2006 (April), Portugal, World Economic Outlook Database, accessed June 22, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/dbginim.cfm.
MBendi Information Services (Pty) Ltd., 2005a, C2C Inc. in joint venture agreement with Rio Narcea on the Penedono gold project, accessed March 15, 2006, at URL http://www.mbendi.co.za/a_view.asp.
MBendi Information Services (Pty) Ltd., 2005b (December 6), EuroZinc continues drilling at Zambujal, Portugal, accessed March 15, 2006, at URL http://www.mbendi.co.za/a_sndmsg/news_view.asp.
MBendi Information Services (Pty) Ltd., 2005c, 2005 (February 7), Iberian Resources intersects high grade gold at the Montemor gold project, accessed March 15, 2005, at URL http://www.mbendi.co.za/a_sndmsg/news_view.asp.
Primary Metals Inc., 2006 (January 20), Panasqueira Mine output increases, accessed March 15, 2006, at URL http://www.primarymetals.ca/i/NewsReleases.asp.
Redcorp Ventures Ltd., 2005a, Lagoa Salgada property, accessed July 6, 2006, at URL http://www.redcorp-ventures.com/RedcorpLagoa.php.
Redcorp Ventures Ltd., 2005b (July 19), Portugal drilling program commences, accessed August 24, 2005, at URL http://www.redcorp-ventures.com/news.php.
U.S. Central Intelligence Agency, 2006, Portugal, World Factbook 2006, accessed June 22, 2006, at URL http://www.cia.gov/cia/publications/factbook/html.
U.S. Energy Information Administration, 2006 (June), Iberian Peninsula, accessed June 26, 2006, at URL http://www.eia.doe.gov/emeu/cabs/iberian_peninsula/oil.html.

Major Sources of Information

Cabinete Para Pesquisa e Exploração de Petróleo-MIE
Rue Vale do Pereiro, 4
1200 Lisbon, Portugal
Instituto Geológico e Mineiro
R. Almirante Barroso, 38
1000 Lisbon, Portugal

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TABLE 1
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
METALS						
Aluminum, secondary[e]	thousand metric tons	18	16	18	16	18
Arsenic, white[e]		50	25	25	15	15
Beryl, concentrate, gross weight[e]		5	5	5	5	5
Copper, mine output, Cu content		82,965	77,227	77,581	95,743	89,541 [2]
Iron and steel:						
Iron ore and concentrate, manganiferous:[e]						
Gross weight		14,500	14,000	14,000	14,000	14,000
Fe content		11,000	10,000	10,000	10,000	10,000
Metal:						
Pig iron[e]	thousand metric tons	82 [2]	100	100	100	100
Steel:						
Crude	do.	728	894	722	720	725
Hot rolled[e]	do.	865 [2]	1,054 [2]	1,000	1,000	800
Lead, refined, secondary[e]		4,000	4,000	4,000	4,000	3,000
Manganese, Mn content of iron ore[e]		500	300	300	300	300
Silver, mine output, Ag content	kilograms	23,100	19,500	21,800	24,400 [r, 2]	23,800 [2]
Tin:						
Mine output, Sn content		1,174	574	218 [r]	220	228 [2]
Metal, primary and secondary		716	361	-- [r]	--	--
Tungsten mine output, W content		698	693	715	746 [r]	816 [2]
Uranium concentrate, U_3O_8		5	2	--	--	--
Zinc, smelter, primary[e]		3,600	3,000	3,000	3,000	2,000
INDUSTRIAL MINERALS						
Calcium carbonate[e]		100,000	100,000	100,000	100,000	100,000
Cement, hydraulic	thousand metric tons	10,162 [r]	9,759 [r]	8,567 [r]	8,843 [r]	9,000
Clays:						
Kaolin[3]		146,436	148,706	150,000	152,077 [r, 2]	160,000
Refractory		660,775	614,453	625,000	504,017 [r]	500,000
Diatomite		387	400	300 [r]	-- [r]	-- [2]
Feldspar		112,923	124,117	126,116	98,262 [r]	133,344 [2]
Gypsum and anhydrite		787,646	579,143	419,799 [r]	461,212 [r]	500,000
Lime, hydrated and quicklime[e]		200,000	20,000	200,000	200,000	200,000
Lithium minerals, lepidolite		11,571	16,325	24,606 [r]	28,696 [r]	26,185 [2]
Nitrogen, N content of ammonia		201,600	190,300	244,700	243,900	244,000
Pyrite and pyrrhotite, including cuprous, gross weight[e]		10,000	10,000	10,000	10,000	8,000
Salt, rock		625,785	603,959	602,035	661,704 [r]	597,945 [2]
Sand[e]	thousand metric tons	10,000	10,953 [2]	10,000	10,000	10,000
Sodium compounds, n.e.s.:[e]						
Soda ash		150,000	150,000	150,000	150,000	150,000
Sulfate		50,000	50,000	50,000	50,000	50,000
Stone:						
Basalt[e]		500,000	500,000	403,233 [r, 2]	456,300 [r, 2]	500,000
Calcareous:						
Dolomite	thousand metric tons	1,700 [e]	1,758	1,932 [r]	1,900 [e]	2,000
Limestone, marl, calcite	do.	37,654	51,095	48,780 [r]	51,355 [r, 2]	50,000
Marble	do.	835	802	705 [r]	749 [r, 2]	800
Gabbro[e]	do.	100	100	100	100	100
Granite:						
Crushed	do.	29,246	28,645	30,000	29,665 [r, 2]	30,000
Ornamental	do.	909	900	540	646 [r, 2]	600
Graywacke[e]	do.	1,073 [2]	1,000	806	428 [r, 2]	500
Ophite	do.	149	120	52 [r]	52 [r, 2]	60
Quartz[e]	do.	20	16	16	5 [r, 2]	5
Quartzite	do.	1,036	455	414 [r]	301 [r, 2]	400

See footnotes at end of table.

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TABLE 1--Continued
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005[e]
INDUSTRIAL MINERALS--Continued						
Stone--Continued:						
Schist	thousand metric tons	140 [e]	150	173 [r]	259 [r,2]	260
Slate[e]	do.	40	40	38 [r]	36 [r,2]	40
Syenite	do.	256	185	160	116 [r,2]	150
Sulfur, byproduct, all sources[e]		30,000 [r]	28,000	27,000	25,000	25,000
Talc		8,362	8,916	5,459	6,231 [r]	5,362 [2]
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical[e]	thousand metric tons	300	300	300	300	300
Gas, manufactured[e]	thousand cubic meters	125	125	125	125	125
Petroleum refinery products:[e]						
Liquefied petroleum gas	thousand 42-gallon barrels	4,417 [r,2]	3,869 [r,2]	4,489 [r,2]	3,200	3,200
Gasoline	do.	22,557 [r,2]	21,243 [r,2]	23,469 [r,2]	20,000	20,000
Kerosene and jet fuel	do.	5,293 [r,2]	4,052 [r,2]	5,694 [r,2]	6,500	6,500
Distillate fuel oil	do.	34,675 [r,2]	35,697 [r,2]	37,084 [r,2]	30,000	30,000
Residual fuel oil	do.	19,163 [r,2]	18,359 [r,2]	17,995 [r,2]	19,000	19,000
Unspecified	do.	15,148 [r,2]	16,206 [r,2]	16,535 [r,2]	16,000	16,000
Refinery fuel and losses	do.	6,059 [r,2]	6,278 [r,2]	6,716 [r,2]	3,800	3,800
Total	do.	107,312 [r,2]	105,704 [r,2]	111,982 [r,2]	98,500	98,500

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through June 2006.

[2]Reported figure.

[3]Includes washed and unwashed kaolin.

TABLE 2
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate		Omya Mineral Portuguesa Lda. (Salmon & Cia Lda.)	Mine and plant at Fatima	100
Cement		Cimentos de Portugal S.A. (Cimpor) (Government, 10%)	Plants (3) at Alhandra, Loule, and Souselas	12,000
Copper, concentrate		EuroZinc Mining Corp.	Neves-Corvo Mine near Castro Verde	500
Diatomite		Sociedade Anglo-Portugesa de Diatomite Lda.	Mines at Obidos and Rolica	150
Feldspar		A.J. da Fonseca Lda.	Seixigal Quarry, Chaves	10
Ferroalloys		Electrometalúrgia S.A.R.L.	Plant at Setubal	100
Kaolin		Saibrais Arelas e Caulinos S.A. (Denain Anzin Mineraux S.A.)	Mines at Casal dos Bracais and Mosteiros	175
Petroleum, refined	42-gallon barrels per day	Petroleos de Portugal (Government, 100%)	Refineries at Lisbon, Porto, and Sines	300,000
Pyrite		Pirites Alentejanas S.A. (EuroZinc Mining Corp.)	Mine at Aljustrel, plant at Setubal	100
Steel, crude		SN Servicos S.A. (Metalúrgica Galaica S.A., 100%)	Steelworks at Maia and Seixal	600
Do.		Lusosider Aços Planos S.A. (Corus Group, 50%, and Sollac S.A., 50%)	Rolling mill at Seixal	400
Tin		EuroZinc Mining Corp.	Neves-Corvo Mine near Castro Verde	15
Tungsten, concentrate	metric tons	Beralt Tin & Wolfram S.A. (Primary Metals Inc.)	Panasqueira Mine and plant at Barroca	1,400
Uranium	do.	Empresa Nacional de Uranio S.A. (Government, 100%)	Mines at Guargia, plant at Urgeirica	150
Zinc, refined		RMC Quimigal S.A.R.L.	Electrolytic plant at Barreiro	12

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THE MINERAL INDUSTRY OF SPAIN

By Harold R. Newman

Spain occupies about 85% of the Iberian Peninsula and has some of the most mineralized territory in Western Europe, including the volcanic-hosted massive sulfide (VMS) deposits of the Iberian Pyrite Belt (IPB) of southern Spain. The IPB stretches from Seville in southern Spain to south of Lisbon in Portugal. The Belt comprises a series of Late Devonian to Mid-Carboniferous age rocks and is dominated by a thick Lower Carboniferous volcanic occurrence referred to as the Volcanic Sedimentary Sequence (VS). The VS is overlain by a southwest-prograding turbiditic sequence which, toward the south, is in turn overlain by a cover of Tertiary and Quaternary alluvial sediments. Within the VS, at least 80 VMS deposits are thought to exist. The IPB alone was estimated to have yielded 1.7 billion metric tons of sulfides. The main polymetallic deposits include the Aznalcollar, the Rio Tinto, the Scotiel, and the Tharsis. Mining activities have mostly ceased in these areas, although exploration was continuing (Cambridge Mineral Resources plc, 2005b§[1]).

Spain has a long history of mining and has attracted interest from many major mining companies for gold and base metal exploration and extraction. International mineral investment has been encouraged by several important factors, including the highly prospective geology of the IPB in the south and the gold discoveries at the Boinas, the Carles, and the El Valle deposits in the Rio Narcea Belt in the north. International mineral investment interest has been encouraged by a transparent legislative framework and a positive fiscal environment for the extraction of natural resources, the country's well-developed infrastructure and skilled workforce, a long mining tradition and track record of exploration success and mine development, and the availability of nonrefundable Government grants for both exploration and mine development (Cambridge Mineral Resources plc, 2005a§).

Minerals belong to the state, and the mineral industry was made up of a mix of state-owned, state and privately owned, and privately owned companies. In terms of the value of mine output of metallic and nonmetallic minerals and quarry products, Spain was one of the leading European Union (EU) countries (Nations Encyclopedia, 2005§).

Spain had a population of more than 42 million in 2005 and a land area of 504,782 square kilometers (km^2), which included the Balearic Islands and the Canary Islands. It is the second largest country in land area in Western Europe after France. In 2005, the gross domestic product (GDP) based on purchasing power parity was $1,089 billion, and the per capita income based on purchasing power parity was $26,320. The inflation rate was 3.4%, and the unemployment rate was about 9% (International Monetary Fund, 2006§).

[1]References that include a section mark (§) are found in the Internet References Cited section.

Government Policies and Programs

Legislation to abolish state and private monopolies was passed in midyear 2002, and the Government continued with its program of liberalizing Spanish industries in 2005. The liberalization of the electricity and natural gas sectors and the loosening of labor market regulations were accomplished faster than required by the EU. Some of Spain's regional governments, such as Andalusia, Asturias, and Catalonia, have expressed interest in the development of mineral resources in their geographic areas.

Environmental Issues

Environmental regulatory bodies in Spain include the Ministerio de Agricultura (Ministry of Agriculture), the Ministerio de Medio Ambiente (Ministry of the Environment), and the Ministerio de Trabajo y Asuntos Sociales (Ministry of Labor and Social Matters).

A major environmental concern continued to be the pollution of the Mediterranean Sea. In 2005, Spain, along with France and Italy, permitted the flow of raw sewage into the sea and was considered to be a major polluter of the Mediterranean. Effluents from the offshore production of natural gas and petroleum, water quality and quantity, and deforestation were other environmental issues for the country (Haaretz, 2006§).

Production

Production of selected mineral commodities is listed in table 1. Primary aluminum metal production increased. With a few exceptions, mine production was lower than that of 2004. Production of mined lead and mined zinc ceased in the past few years owing to closures of the Aznalcollar, the Reocin, the Rubiales, the Sotiel, and the Tharsis Mines. Mine production of silver decreased. Total refined copper production increased along with secondary lead production. Gold production also increased. Quarried mineral products, particularly quarried stone, accounted for a significant share of the mineral production in Spain. Spain has been a major producer of mercury in the past; its annual mercury production varies according to demand and price. Spain was a leading producer of natural sodium sulfate, and slate and strontium minerals, and an important processor of domestic and imported raw materials.

Trade

Spain's international economic profile has grown appreciably in recent years. Spain was the fifth largest economy in the EU and the world's 15th ranked exporting country. Spain's accession to the EU in January 1986 required the country to open its economy to trade and investment, modernize its industrial base, improve infrastructure, and revise economic

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legislation to conform to EU guidelines. Spain followed the U.S.-EU mutual recognition agreements in its application of nontariff regulations and conformity assessments procedures.

The share of foreign trade in Spain's GDP was about 55%. Spain's top three export partners were France, Germany, and Portugal. Its top three import partners were Germany, France, and Italy (Federation of International Trade Association, 2007§).

Outside of Europe, the largest and most important trading partner of Spain was the United States. U.S. trade with Spain for 2004 (the latest year for which data were available) is listed in tables 3 and 4. The United States accounted for 3.8% of Spain's exports and 3.6% of Spain's imports. The value of exports was $6.9 million and the value of imports was $8.6 million, resulting in a –$1.7 million trade balance (U.S. Census Bureau, 2007§).

Structure of the Mineral Industry

The structure of Spain's mineral industry is listed in table 2. Minerals belong to the state under an arrangement known as the Regalía Principal. The Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, govern the mineral industry. The Dirección General de Politica Energética y Minas (General Directorate of Energy Policy and Mines) implements these mineral laws. Sociedad Estatal de Participaciones Industriales (SEPI) [State Society of Industrial Participation], which was a state-owned holding company with mining as one sector in its portfolio, and the Instituto Geológico y Minero de España (IMEG) [Mining and Geological Institution of Spain] were the principal Government mineral-resource agencies. In the minerals sector, SEPI (formerly Instituto Nacional de Industria) was concerned mainly with the Hunosa Group (coal) and Minas de Almaden y Arrayanes S.A. (mercury), both of which are Government-owned. IMEG offers assistance in the fields of geology and mining to the private and public sectors through the production of maps and scientific publications.

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Alumina and primary aluminum were produced almost entirely by Alcoa Inespal S.A. (a subsidiary of Alcoa Inc. of the United States) both for domestic consumption and for export. Alcoa Inespal was a holding company with two primary aluminum plants and three flat-rolled sheet and extrusions plants. Alúmina Española S.A., which was located near San Ciprian, was Alcoa's only European producer of alumina and alumina hydrates.

Copper.—Inmet Mining Corp. of Canada announced that it had completed the acquisition of a 70% interest in Las Cruces copper project, which is a high-grade volcanic massive sulfide copper deposit located on the eastern edge of the IPB approximately 15 kilometers (km) northwest of Seville. The project had estimated proven and probable copper reserves of 17 million metric tons (Mt) grading 6.2% copper. The mine had a production capacity of 72,000 metric tons per year (t/yr), and the projected life of the mine was 15 years. All construction and development activities pertaining to the plant and open pit mine were expected to be completed by the first part of 2008 (Inmet Mining Corp., 2006§).

Inmet issued about 11.7% of its issued and outstanding shares to a wholly owned subsidiary of Leucadia National Corp. Leucadia would retain about 30% interest in Las Cruces (Inmet Mining Corp., 2005§).

Gold.—Cambridge Mineral Resources plc of the United Kingdom received a prefeasibility study on the development of the Lomero-Poyatos gold deposit in the IPB in southern Spain. The deposit was reported to contain an estimated indicated and inferred resource of about 20.6 Mt at a mean grade of 3.1 grams per metric ton (g/t) gold, 70 g/t silver, and 3.3% zinc. The study, which was compiled by Wardell Armstrong Ltd., indicated that the project would not generate a sufficiently attractive rate of return to justify its development. However, Wardel Armstrong recommended further work be done to increase Lomero-Poyatos's resource base and recommended a drilling program (Mining Journal, 2005).

Ormonde Mining plc of Ireland sought to build a mid-size suite of projects in Spain that would be focused primarily on gold. The Salomon project, which was located in northwest Spain, was the most advanced project and contained an estimated 20,000 kilograms (kg) of inferred resources of gold. Ormonde's objective was to establish mining operations that could produce copper, gold, and silver. Projects included La Zarza gold-copper project; the Salamanca gold project; the Salamon gold project; the Tracia gold project; and the Trives gold project (Ormonde Mining plc, 2006a§).

La Zarza gold-copper project was situated within a mining concession in the IPB in southwest Spain. Ormonde was earning a 70% interest in the project by providing €1.8 million ($2.2 million[2]) during a 3-year period under an option agreement with the property owner, Nueva Tharsis S.A.L. La Zarza deposit, which had been formerly mined for pyrite (iron sulfide only), contained copper, gold, and silver mineralization (Ormonde Mining plc, 2005a§).

Ventura Gold Corp. announced a core-drilling program at the Navelgas gold property, which is located in northwest Spain approximately 30 km south of Luarca, Province of Asturias. The property is located within the Navelgas Gold Belt, which comprises three major northeast-trending structural zones, La Freita, the Linares, and the Pola de Allande. The Navelgas Gold Belt is about 70-km long and 18-km wide and hosts more than 30 ancient Roman workings. It is similar geologically and structurally to the Rio Narcea Gold Belt (located about 30 km to the east), which hosts Rio Narcea Gold Mines Ltd.'s (RNG's) Carles and El Valle gold mines. Ventura's exploration program was focused on the Linares zone, where gold mineralization was found in a gold porphyry system that was discovered by RNG (CCN Matthews, 2005§).

Iron and Steel.—Compañia Española de Laminación S.L. (Celsa) produced about 1.6 million metric tons per year (Mt/yr) of steel in 2005. Heat lamination of billets was carried out in three mills, each with its own specifications. One mill produced corrugated round rods and rolls; a second mill produced flat bars, squares, angular and round rods, and light sections; and a third mill produced thick structural sections (Compañia Española de Laminación S.L., 2005§).

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Corporacion Sidenor planned to start producing stainless steel by expanding its existing electric arc furnace at its works in Basauri, northern Spain. Sidenor intended to melt its first stainless steel in the beginning of 2006 after ordering the expansion from SMS Demag. Sidenor was Spain's leading special long-products, forgings, and moulded parts group (Metal Bulletin, 2005b).

A joint venture of Gerdau Group of Brazil, Santander Group of Spain, and executives of Sidenor signed a €463.3 million ($556 million) agreement to acquire the entire capital stock of Sidenor. The investment would allow Gerdau to enter the strategic EU market and provide it with access to large international automobile makers (Metal Bulletin, 2005a).

Alcan announced that it had completed its sale of Pechiney Électrométallurgie to Ferroatlántica S.L., which was Spain's leading ferroalloy producer. Initially announced in December 2004, the value of this transaction was expected to generate €120 million ($183 million). Alcan stated that the agreement was consistent with its strategy of focusing on aluminum and divesting noncore activities (Alcan Inc., 2005§).

Mercury.—Minas de Almadén y Arrayanes S.A. at Almaden was a leading producer of liquid mercury metal. Production was based on demand and price. Almaden is located about 200 km south of Madrid in the Province of Ciudad Real in the Brown Mountain range.

Nickel.—Flor Corp. completed construction of RNG's nickel plant in southwestern Spain at yearend 2004. The plant processed its first output in December 2004 from RNG's Aguablanca Mine. The nickel sulfide flotation plant was designed to treat 1.5 Mt/yr of ore and to produce a bulk copper-nickel-platinum-group metals (PGM) concentrate. The Aguablanca copper-nickel-PGM deposit was defined by more than 45,000 meters (m) of drilling. Formed by three zones of magmatic sulfide mineralization, the deposit occurs in a gabbro-norite intrusive along the north contact of the Santa Olalla granodiorite complex. The mineralization is similar in type to both the Voisey's Bay deposit in eastern Canada and the Noril'sk deposit in Russia. Nickel, copper, platinum, and palladium mineralization occurs within magmatic breccia bodies that form gossans at the surface. Pyrrhotite, pentlandite and chalcopyrite make up the dominant sulfide mineralization.

The Aguablanca Mine consists of an open pit and an onsite processing plant. Initial open pit mine life was estimated to be 10.5 years and the mine was expected to produce 8,200 metric tons per year (t/yr) of nickel metal. Underground ramp development and infill drilling was proceeding. The first phase of the program was to examine mineralization below the proposed limits of the open pit; this first phase was expected to be completed by yearend 2005 (Rio Narcea Gold Mines Ltd., 2005§).

Silver.—Ormonde reported that it had entered into an agreement with Polar Mining Oy (a Finnish subsidiary of Dragon Mining NL), which would allow Ormonde to acquire a 50% interest in the Valiña silver project in Lugo Province, northern Spain. Ormonde planned to focus on the potential for an open pit mine with a high-grade resource. Limited previous drilling returned a best interval of 6 m at grades of 451 g/t silver and 1.7 g/t gold, including 1 m at grades of 2,020 g/t silver and 5.8 g/t gold. Anomalous antimony, gold, lead, and silver soil geochemistry occurs over a strike length of 1.1 km. Ormonde's initial work program would entail metallurgical testing designed to investigate the possibility of producing a concentrate containing antimony, gold, and silver for direct sale to a smelter (Ormonde Mining plc, 2005b§).

Tungsten.—Ormonde announced that it had entered into an option agreement to buy the Barruecopardo tungsten tailings project, which is located in the permit area of its Salamanca gold project in western Spain. During the option period, which would run until September 2006, Ormonde would assess the grade, volume, and rate of recovery of the tungsten contained in the dumps and tailings. Recent sampling by Ormonde confirmed the presence of gold with the tungsten, and the company would evaluate that potential. The Barruecopardo Mine, which closed in the early 1980s, was one of Europe's largest tungsten operations at the time that it was closed (Ormonde Mining plc, 2006b§).

Zinc.—Asturiana de Zinc S.A. continued production at its San Juan de Nieva Castrillo plant. Asturiana's core business was the refining and production of zinc metal, mainly zinc ingots. The San Juan de Nieva plant, which had a capacity of 480,000 t/yr, was the leading single zinc smelter in the world and also one of the world's lowest-cost operations (Xstrata plc, 2005§).

Industrial Minerals

Barite.—Minerales y Productos Derivados S.A. (Minersa) was a main supplier of drilling grade material. Minersa continued to operate a surface mine and a plant at Vera.

Cement.—Cementos Portland Valderrivas planned to boost its white cement production rate from 700 metric tons per day (t/d) to 900 t/d while achieving a significant emission reduction by converting their El Alto plant near Madrid. The conversion would include the integration of a calciner into the existing preheater, the installation of a new rotary kiln drive, and replacement of the clinker cooler. Recommissioning of the modernized plant was scheduled for the second half of 2006 (Polysius AG, 2005§).

Fluorspar.—Minersa was Europe's leading fluorspar producer owing to its three deposits in the Province of Asturias in northern Spain. The Emilio, the Jaimina, and the Moscona underground mines produced a combined 420,000 t/yr of crude fluorspar.

Potash.—Iberpotash S.A. was a 100% owned subsidiary of Dead Sea Works Ltd., which was a leading producer of potash and an important potash resource in Western Europe. Iberpotash mined sylvinite and sylvite ore from the Cataluna deposit in the Suria area.

Sepiolite.—Spain, whose reserves of sepiolite in the Tagus Basin represent 70% of the world's reserves, maintained its world leadership in sepiolite production. The largest deposit was thought to be in excess of 15 Mt (Grupo Tolsa, 2005§).

[2]Where necessary, values have been converted from EU euros (€) to U.S. dollars (US$) at the rate of €1.00=US$1.20.

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Spain was strongly dependent upon imports of energy—it had no major oilfields, one natural gas field located offshore, and coal mines that consisted mainly of low-quality coal. Reserves of petroleum were estimated to be 158 million barrels; natural gas reserves to be 72 million cubic meters; and coal reserves, 655 Mt (U.S. Energy Information Administration, 2005§).

Output of natural gas and petroleum decreased compared with that of 2004. Spain's production of crude oil was limited, and the country continued to be a large importer of mineral fuels. Spain imported about 99% of its crude oil mainly from Russia, 15%; Mexico, 14.7%; Saudi Arabia, 12.7%; and Libya, 12.2%. Almost all Spain's natural gas production came from one offshore field, Poseidon, which was operated by Repsol YPF S.A.. The country imported 60% of its natural gas from Algeria (U.S. Energy Information Administration, 2005§).

Spain was the fifth-ranked electricity market in the EU. The country produced 229 billion kilowatts of electricity and consumed 218.4 billion kilowatts. The largest share of electricity generation came from conventional thermal plants (52.3%), hydroelectricity (25.2%), nuclear (14.9%), and other renewables (7.6%). Electricity consumption has grown considerably and has strained the electricity infrastructure, and several major blackouts were attributed to supply shortages or transmission grid malfunction (U.S. Energy Information Administration, 2005§).

Coal.—Coal reserves were abundant but difficult to mine. Consequently, the cost of production was high, which made Spanish coal less competitive than that of many other countries. Spain's attempts to modernize and restructure its coal industry has resulted in a decline in total coal production but has not led to decreased production costs. The leading producer of bituminous coal was the Hunosa Group, and the leading producer of lignite was Empresa Nacional de Electricidad S.A. (International Energy Agency, 2005§).

Renewable Energy.—Spain was the world's second-ranked producer of wind power after Germany, with the energy source meeting 6% of Spain's total electricity demand. Spain has 13,000 megawatts (MW) of installed wind capacity, and was to increase this amount to 20,000 MW by 2010 which would account for 12% of the country's total energy generation (Agence France Presse, 2005§).

Outlook

The Government was expected to continue with its privatization and liberalization efforts in the mineral industry. The economy will continue to be affected by the demands of EU integration and will grow modestly. About 80% of Spain's mining production is industrial minerals and rocks, and this is expected to continue. The country will continue to have a strong dependence on external sources of energy. Production of coal could eventually be phased out despite ongoing EU subsidies to maintain production. These subsidies are expected to be eliminated by 2010. More attention will most likely be directed toward renewable energy.

References Cited

Metal Bulletin, 2005a, Gerdau and Santander buy Spain's Sidenor for €463: Metal Bulletin, no. 8920, November 21, p. 5.
Metal Bulletin, 2005b, Special steel: Metal Bulletin, no. 8903, July 25, p. 18.
Mining Journal, 2005, Lomero-Poyatos no go: Mining Journal, July 22, p. 10.

Internet References Cited

Agence France Presse, 2005 (August 28), Energy generation, accessed September 29, 2005, at URL http://www.yahoo.com/s/afp/20050826/sc_afp.
Alcan Inc., 2005 (June 1), Alcan completes sale of its controlling interest in Aluminium de Grèce, accessed February 28, 2006, via URL http://www.alcan.com/web/publishing.nsf.
Cambridge Mineral Resources plc, 2005a (November 26), Positive gold assays returned from San Telmo project, accessed January 6, 2005, via URL http://www.cambmin.co.uk.
Cambridge Mineral Resources plc, 2005b, Spain, accessed September 29, 2006, at URL http://www.cambmin.co.uk/print.php?page=spain.
CCN Matthews, 2005 (September 13), Ventura commences drilling at Navelgas gold property in Spain, accessed September 24, 2005, at URL http://www.ccnmatthews.com/news/releases/show.jsp.
Compañia Española de Laminación, S.L., 2005, Quality and service—Our commitment, accessed October 28, 2005, at URL http://www.celsa.com/EN/zonapublica/empresa.aspx.
Federation of International Trade Association, 2007 (January), Spain—International trade, accessed July 26, 2007, at URL http://www.fita.org/countries/panorama_17.html.
Grupo Tolsa, 2005, Raw materials: Sepolite, accessed September 28, 2006, at URL http://www.tolsa.com/ing1/materias/iframe_sepiolite.html.
Haaretz, 2006 (June 28), Streaming filth to the sea, accessed September 28, 2006, at URL http://www.haaretz.com/hasen/objects/pages/PrintArticleEn.jhtml?itemNo=768122.
Inmet Mining Corp., 2005 (August 22), Inmet Mining announces completion of acquisition of 70 percent interest in the Las Cruces copper project in Spain, accessed September 24, 2006, at URL http://www.canadanewswire.com/en/releases/archive/August2005/22/c2008.html.
Inmet Mining Corp., 2006, Key project statistics, accessed August 8, 2007, at URL http://www.inmetmining.com/ouroperations/development/LasCruces/default.aspx.
International Energy Agency, 2005, Spain, Chapter 19, accessed March 14, 2006, at URL http://www.ieawind.org/iea_wind_pdf.
International Monetary Fund, 2006 (September), Report for selected countries—Spain, accessed September 27, 2006, at URL http://www.imf.org/external/pubs/ft/weo/2006/02/data/weorept.aspx.
Nations Encyclopedia, 2005 (November), Spain—Mining, accessed September 28, 2006, at URL http://www.nationsenclyclopedia.com/Europe/Spain-MINING.html.
Ormonde Mining plc, 2005a, Background to the La Zarza project, accessed August 15, 2005, at URL http://www.ormondemining.com/pr050815_LaZarza.htm.
Ormonde Mining plc, 2005b (September 8), Deal signed on high-grade silver-gold deposit in Spain, accessed September 12, 2006, at URL http://www.ormondemining.com/pr050908_Valina.htm.
Ormonde Mining plc, 2006a, Major gold-copper projects, accessed January 10, 2006, at URL http://www.ormondemining.com/projects.htm.
Ormonde Mining plc, 2006b (February 28), Option to acquire tungsten project in Salamanca, accessed February 28, 2006, at URL http://www.ormondemining.com/pr060228_Tungsten.htm.
Polysius AG, 2005 (September 14), Spain—Increasing the output of the El Alto white cement kiln line, accessed October 12, 2006, at URL http://www.polysisus.com/newsreadarchiv.asp.
Rio Narcea Gold Mines Ltd., 2005, Nickel operations, accessed March 14, 2006, at URL http://www.rionarcea.com/s/Aguablanca.asp.
U.S. Census Bureau, 2007, Foreign Trade Division—Trade with Spain—2005, accessed August 1, 2007, at URL http://www.census.gov/foreign-trade/balance/c4700.html.
U.S. Energy Information Administration, 2005 (March), Spain, Country Analysis Briefs, accessed March 22, 2005, at URL http//www.eia.doe.gov/emeu/cabs/spain.html.
Xstrata plc, 2005, Zinc, accessed September 28, 2006, at URL http://www.xstrata.com/prod_zinc.php.

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Major Sources of Information

Instituto Geológico y Minero de España
Rio Rosas, 23
28003 Madrid, Spain
Ministerio de Ciença y Technología
Doctor Fleming, 7
28036 Madrid, Spain

TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003[e]	2004[e]	2005[e]
METALS						
Aluminum:						
Alumina[e, 2]		1,100,000	1,000,000	1,000,000	1,000,000	1,000,000
Metal:						
Primary		376,400	380,100	389,100 [3]	397,500 [3]	421,580 [3]
Secondary		221,720	242,600	245,000 [3]	245,000 [3]	293,222 [3]
Total		598,120	622,700	634,100 [3]	642,500 [3]	714,802 [3]
Copper:						
Mine output, Cu content		9,748	1,248	643	1,448 [3]	889
Metal:						
Blister:						
Primary		255,200	281,300	280,000	224,300 [r, 3]	284,200 [3]
Secondary		24,700	16,700	20,000	14,100 [3]	10,000
Total		279,900	298,000	300,000	238,400 [r, 3]	294,000
Refined:						
Primary		235,100	271,500	276,300 [3]	208,241 [3]	267,300 [3]
Secondary		55,600	36,700	14,000	35,000 [3]	35,000
Total		290,700	308,200	290,300 [3]	243,241 [3]	302,000
Germanium oxide, Ge content[e]	kilograms	6,000	5,000	5,000	5,000	5,000
Gold, mine output, Au content	do.	3,720	5,158	5,362 [3]	5,248 [r, 3]	5,500
Iron and steel, metal:						
Pig iron	thousand metric tons	4,094	3,978	3,645 [r, 3]	4,036 [r, 3]	4,200
Ferroalloys, electric furnace	do.	180 [e]	175	175	175	180
Steel:						
Crude	do.	15,834	16,358	16,287 [3]	17,684 [3]	17,800
Hot rolled	do.	14,931	15,000 [e]	14,000	15,000	15,000
Lead:						
Mine output, Pb content		36,000	6,171	1,765 [3]	--	--
Metal, secondary[e]		121,600 [3]	116,000	99,100 [3]	105,600 [3]	110,000 [3]
Mercury, mine output, Hg content		524	727	500	250	--
Nickel, Ni content of concentrate		--	--	--	(4)	5,380 [3]
Silver, mine output, Ag content	kilograms	54,836	3,409	2,246 [3]	3,583 [r, 3]	2,300
Tin, mine output, Sn content[e]		425	267	247 [3]	231 [r, 3]	--
Uranium, mine output:						
U content		353	315	170	170	--
U_3O_8 content		416	372	200	200	--
Zinc:						
Mine output, Zn content		164,900	69,926	15,100	--	--
Metal, primary and secondary		436,800	502,400	519,900 [3]	531,700 [3]	501,400 [3]
INDUSTRIAL MINERALS						
Barite, $BaSO_4$		50,640	52,494	44,660 [3]	40,776 [r, 3]	37,000
Calcium carbonate[e]		2,000	2,000	2,100	2,000	2,000
Cement, hydraulic, other than natural	thousand metric tons	40,512	42,417	44,747 [r, 3]	45,593 [r, 3]	50,347 [3]

See footnotes at end of table.

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TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003[e]	2004[e]	2005[e]
INDUSTRIAL MINERALS--Continued						
Clays:						
Attapulgite		24,477	22,918	18,975 [3]	20,796 [r,3]	20,000
Bentonite		100,000	123,457	103,174 [3]	156,760 [r,3]	105,000
Kaolin, washed		440,000	419,483	450,000	437,990 [r,3]	450,000
Other[e]	thousand metric tons	15,000	15,000	15,000	15,000	15,000
Diatomite and tripoli		66,433	53,558	52,700	33,799 [r,3]	34,000
Feldspar		514,285	538,407	600,000	552,507 [r,3]	580,000
Fluorspar, CaF_2 content:						
Acid-grade		126,535	131,155	129,195 [3]	135,505 [r,3]	133,495 [3]
Metallurgical-grade		7,504	10,279	10,503 [3]	10,186 [r,3]	10,500
Total		134,039	141,434	139,698 [3]	145,691	143,995
Gypsum and anhydrite, crude	thousand metric tons	11,901	11,218	11,500 [3]	12,534 [r,3]	13,000
Lime, hydrated and quicklime[e]	do.	1,700	1,800	1,800	1,800	1,818 [3]
Magnesite, calcined		156,000	150,000 [e]	150,000	150,000	150,000
Mica		10,000 [e]	11,786	11,800	7,825 [r,3]	10,000
Nitrogen, N content of ammonia	thousand metric tons	436	415	432 [3]	404	400
Pigment, mineral:						
Ocher		126,000	140,000	174,153 [3]	138,050 [r,3]	140,000
Red iron oxide[e]		5,000	4,500	5,404 [3]	1,734 [r,3]	1,500
Potash, K_2O equivalent		569,127	481,329	594,355 [3]	590,000	575,000
Pumice		857,223	701,528	711,898 [3]	553,210 [r,3]	500,000
Pyrite, including cuprous, gross weight	thousand metric tons	152	100 [e]	--	--	--
Salt:						
Rock, including byproduct from potash works	do.	2,200	2,560 [e]	2,563 [3]	2,657 [r,3]	2,600
Marine and other	do.	1,500	1,334	1,400	1,336 [r,3]	1,350
Sand and gravel, silica sand[5]	do.	95,000 [e]	95,768	105,000	113,948 [r,3]	135,000
Sepiolite, meerschaum		896,983	733,134	690,395 [3]	851,647 [r,3]	800,000
Sodium compounds, n.e.s.:[e]						
Soda ash, manufactured	thousand metric tons	500	500	500	500	500
Sulfate, natural:						
Glauberite, Na_2SO_4 content		705,000	754,945 [3]	815,560 [3]	944,971 [r,3]	950,000
Thenardite, Na_2SO_4 content		168,000	160,000	200,000	165,030 [r,3]	165,000
Manufactured		125,000	125,000	125,000	125,000	125,000
Stone:						
Chalk[e]	thousand metric tons	980	876	920	1,063 [r,3]	1,000
Dolomite	do.	9,628	11,537	12,000	14,489 [r,3]	15,000
Limestone[e]	do.	250,000	236,411 [3]	248,000	265,694 [r,3]	270,000
Marble, ornamental	do.	3,941	5,230	5,000	2,245 [r,3]	2,620 [3]
Marl	do.	10,495	10,000 [e]	10,000	10,356 [r,3]	10,000
Basalt	do.	3,348	3,400 [e]	3,400	5,094 [r,3]	5,000
Granite, ornamental[e]	do.	1,200	1,200	1,412 [3]	2,471 [r,3]	2,500
Ophite	do.	2,840	2,800 [e]	2,800	3,874 [r,3]	4,000
Phonolite	do.	1,630	1,761	2,000	1,729 [r,3]	1,800
Porphyry	do.	2,483	1,971	2,100	1,139 [r,3]	1,100
Quartz	do.	2,150	2,000 [e]	2,000	1,139 [r,3]	1,100
Quartzite	do.	2,150	2,784	2,900	2,873 [r,3]	2,800
Sandstone	do.	2,430	2,246	2,400	3,608 [r,3]	3,400
Other	do.	897	900 [e]	900	900	900
Slate	do.	790 [e]	828	837 [3]	1,429 [r,3]	1,200
Other[e]	do.	1,000	1,000	1,000	1,000	1,000
Strontium minerals, Sr_2O_4 content		143,320	171,293	152,383 [3]	192,942 [r,3]	188,000

See footnotes at end of table.

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TABLE 1--Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003[e]	2004[e]	2005[e]
INDUSTRIAL MINERALS--Continued						
Sulfur:						
S content of pyrites	thousand metric tons	90	--	--	--	--
Byproduct:[e]						
Metallurgy	do.	461	544	500	500	500
Petroleum	do.	135	140	150	150	150
Coal (lignite) gasification	do.	1	1	1	1	1
Total	do.	687	685	651	651	651
Talc and steatite[e]		115,000	115,000	115,000	107,892 [r, 3]	100,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	4,694	4,393	3,863 [3]	3,692 [r, 3]	3,889 [3]
Bituminous	do.	5,797	5,383	5,531 [3]	5,220 [r, 3]	4,666 [3]
Lignite	do.	12,193	8,762	8,795 [r, 3]	8,147 [r, 3]	7,587 [3]
Total	do.	22,684	18,538	18,189 [r, 3]	17,100 [r]	16,142 [3]
Coke, metallurgical	do.	2,400 [e]	2,628	2,500	2,500	2,500
Gas, natural, marketed	thousand cubic meters	556,650	553,156	550,000	370,019 [r, 3]	330,000
Peat[e]		50,000	55,302 [3]	55,000	57,229 [r, 3]	60,000
Petroleum:						
Crude	thousand 42-gallon barrels	2,505	2,427	2,404 [3]	1,913 [r, 3]	1,261 [3]
Refinery products:						
Liquefied petroleum gas	do.	18,250 [r]	35,164	33,234 [3]	33,072 [r, 3]	33,698 [3]
Naphtha	do.	25,000 [e]	26,069	25,000	25,000	25,000
Gasoline, motor	do.	78,366 [r]	74,035	76,431 [r, 3]	87,797 [r, 3]	87,593 [3]
Jet fuel	do.	29,529 [r]	28,944	24,456 [3]	21,688 [r, 3]	21,224 [3]
Kerosene	do.	16,000 [e]	15,965	15,942 [3]	16,000	16,000
Distillate fuel oil	do.	150,526 [r]	149,759	111,676 [3]	112,000	112,000
Residual fuel oil	do.	75,993 [r]	68,085	60,353 [3]	55,730 [r, 3]	57,294 [3]
Other	do.	82,381 [r]	80,483 [r]	79,461 [r, 3]	80,000 [r]	80,000
Refinery fuel and losses	do.	27,193 [r]	25,146 [r]	27,631 [r, 3]	26,000 [r]	26,000
Total	do.	503,238 [r]	503,650 [r]	454,184 [r, 3]	457,000 [r]	459,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. -- Zero.

[1]Table includes data available through October 2006.

[2]Reflects aluminum hydrate.

[3]Reported figure.

[4]The Aguablanca operation of Rio Narcea Gold Mines Ltd. was commissioned in December 2004.

[5]Includes sand obtained as a byproduct of feldspar and kaolin production.

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TABLE 2
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		Alúmina Española S.A. (Alcoa Inc.)	Alumina plant at San Ciprian, Lugo	1,000
Aluminum		do.	Electrolytic plant at San Ciprian, Lugo	230
Do.		Alcoa Inespal S.A. (Alcoa Inc.)	Electrolytic plant at Aviles	85
Do.		do.	Electrolytic plant at La Coruña	85
Barite		Minerales y Productos Derivados S.A.	Mine and plant at Vera, Almeria	100
Bentonite		Süd-Cheme España SL	Mine and plant at Yuncos, Toledo	150
Cement		Ashland S.A.	Puerto de Sagunton, Valencia	2,000
Do.		do.	Villaluenga de la Sagra, Toledo	2,000
Do.		do.	3 other plants	2,000
Do.		35 other companies	49 other plants	38,000
Coal:				
Anthracite		Antracitas Gaiztarro S.A.	Mines at Maria and Paulina	2,000
Do.		do.	Mines near Oviedo	2,000
Do.		Antracitas del Bierzo S.A.	Mines near Leon	1,000
Bituminous		Hunosa Group, (Government, 100%)	Various mines and plant near Oviedo	3,300
Do.		Hulleras Vasco Leonesa S.A.	Santa Lucia Mine, Leon	2,000
Do.		Minas de Figaredo S.A.	Mines near Oviedo	1,000
Do.		Nacional de Carbon del Sur (Encasur)	Rampa 3 and San Jose Mines, Cordoba	200
Lignite		Empresa Nacional de Electricidad S.A. (Endesa)	As Pontes Mine, and Andorra Mine, La Coroña	15,000
Copper:				
Metal		Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Refinery at Huelva	270
Do.		do.	Electrolytic refinery at Huelva	105
Do.		Industrias Reunidas de Cobre	Smelter at Asua-Bilbao	30
Do.		Elmet SL	Smelter and electrolytic refinery at Berango, Vizcaya	60
Ore, metal		Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Mines and plant at Arientero near Santiago de Compostela	12
Do.		do.	Alfredo underground mine in Rio Tinto area	30
Do.		Minas de Rio Tinto S.A.	Cero Colorado open pit mine	20
Dunite		Pasek España S.A.	Mines and plant at Landoy, Ortigueira	1,500
Fluorspar, ore		Minerales y Productos Derivados S.A.	Plant at Torre, Austrias	150
Do.		do.	Underground mines at Emilio, Jaimina, and Moscona, Austrias	420
Gold	kilograms	Rio Narcea Gold Mines, Ltd.	El Valle and Carles mines, Asturias	3,750
Lead:				
Metal		Española del Zinc S.A.	Refinery at Cartagena, Murcia	50
Do.		Compañia La Cruz, Minas y Fundaciones de Plomo S.A.	Smelter at Lineares, Jaen	40
Do.		do.	Refinery at Lineares, Jaen	40
Do.		Tudor S.A.	Secondary smelter at Saragoza	16
Do		Ferroaleaciones Españolas, S.A.	Secondary smelter at Medina del Campo	12
Do		Derivados de Minerales y Metales	Secondary smelter at Barcelona	5
Ore		Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya, France, 90%)	Opencast mine at Montos de Los Azules	25
Do.		Andaluza de Piritas S.A.	Mine at Aznalcollar (closed 2001)	21
Do.		Exploración Minera International España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	16
Magnesite		Magnesitas Navarras S.A.	Mine at Eugui, plant at Zubiri	600
Do.		Magnesitas de Rubián S.A.	Plant at Monte Castel	70
Mercury	flasks	Minas de Almadén y Arrayanes S.A., (Government, 100%)	Mines and smelter at Almaden	70,000
Nickel, metal		Rio Narcea Gold Mines, Ltd.	Aguablanca Mine, Extremadura	8

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TABLE 2--Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:				
Crude	42-gallon barrels per day	Chevron S.A.	Oilfield at Casablanca	300
Refined	do.	Repsol YPF S.A.	Refinery at Escombreras	200,000
Do.	do.	do.	Refinery at Puertollano	14,000
Do.	do.	do.	Refinery at Tarragona	260,000
Do.	do.	Refineria de Petróleos del Norte S.A. (Petronor)	Refinery at Somorrostro	240,000
Do.	do.	Compañía Española de Petróleos S.A. (Cepsa)	Refinery at Santa Cruz de Tenerife	160,000
Do.	do.	Petroleos del Mediterraneo S.A. (Petromed)	Refinery at Castellón de la Plana	120,000
Do.	do.	Compañía Iberica Refinadora de Petróleos S.A. (Petroliber)	Refinery at La Coruña	140,000
Potash, ore		Iberpotash S.A. (Dead Sea Works Ltd.)	Mines and plants at Suria near Barcelona	850
Pyrite		Compañia Española de Mines de Tharsis	Mines and plants at Tharsis and Zarza (closed)	1,300
Do.		do.	Plant at Huelva	600
Sepiolite		Tolsa S.A.	Mine and plant at Vicalvaro near Madrid	100
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Villecas near Madrid	200
Sodium sulfate		Crimidesa S.A.	Mine and plant at Cerezo de Rio, Burgos	600
Steel		Aceralia Corporación Siderúrgica (Arbed S.A., 35%)	Plants at Aviles, Gijon, Sagunto, and Sestao	8,000
Do.		Cia Espanola de Laminacion SL (Celsa Group, 100%)	Plant at Barcelona	1,600
Strontium		Solvay Minerales S.A.	Mines and plant at Escuzar, Granada	85
Do.		Bruno S.A.	Mine and plant at Montevives, Granada	50
Uranium, U_3O_8	metric tons	Empresa Nacional del Uranio (Enusa) (Government, 100%)	Mines and plant near Ciudad Real	500
Zinc:				
Metal		Asturiana de Zinc S.A. (Azsa) (Xstrata plc, 100%)	Electrolytic zinc plant at San Juan de Nieva Castillon	480
Do.		Española del Zinc S.A.	Electrolytic plant at Cartagena	50
Ore		Asturiana de Zinc S.A. (Xstrata plc, 100%)	Reocin mines and plants (closed 2003)	500
Do.		Exploración Minera International España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	500
Do.		Sociedad Minera y Metalúrgica de Penarroya-Espana S.A.	Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustin	200

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TABLE 3
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals		394	--	All to Switzerland.
Alkaline-earth metals		62,628	--	France 39,898; Portugal 22,238; Finland 468.
Aluminum:				
Ore and concentrate		4,158,813	4	Portugal 3,021,437; Italy 639,000; France 267,375.
Oxides and hydroxides	metric tons	733,736	3	Netherlands 299,959; Norway 77,015; Poland 74,834.
Ash or residue containing aluminum		1,137,687	36,000	Italy 1,101,687.
Metal, including alloys:				
Scrap		36,590,105	--	Portugal 10,749,113; China 7,293,460; Germany 5,728,093.
Unwrought	metric tons	102,330	40	Portugal 26,566; France 26,083; Italy 21,686.
Semimanufactures:				
Powders and flakes	do.	695	--	Germany 533; United Kingdom 81; Netherlands 59.
Rods, bars, profiles	do.	95,978	195	France 31,621; Portugal 18,040; United Kingdom 12,579.
Wire		15,719,684	495,045	Italy 4,157,596; Belgium 2,315,135; Austria 1,815,706.
Plates, sheets, strips		31,723,232	1,755,000	Switzerland 8,381,802; France 5,307,652; Italy 4,245,819.
Foil	metric tons	33,132	854	France 7,658; Germany 5,883; United Kingdom 1,994.
Tubes and pipes		5,981,884	5,750	Germany 1,244,152; France 1,182,062; Turkey 621,624.
Tube or pipe fittings		839,844	97,222	France 291,875; Uruguay 132,187; Portugal 106,007.
Antimony:				
Ore and concentrate		2,000	--	All to Portugal.
Oxides		797,318	--	Italy 528,750; Netherlands 75,000; France 66,656.
Metal, including alloys, all forms		409,160	--	Israel 379,062; Morocco 14,000; France 6,000.
Arsenic, metal, including alloys, all forms		1	--	Unspecified 1.
Beryllium, metal, including alloys, all forms		5,312	--	All to Portugal.
Bismuth, metal, including alloys, all forms		1,802	--	Portugal 1,062; Brazil 296; Israel 250.
Cadmium, metal, including alloys, all forms		34	--	Portugal 23; unspecified 11.
Chromium:				
Ore and concentrate		2,112,683	--	Portugal 1,636,375; Italy 371,750; France 43,558.
Oxides and hydroxides		957,489	--	Italy 245,499; France 155,226; Germany 64,769.
Metal, including alloys, all forms		904,919	173,753	France 283,050; Germany 120,210; Norway 101,367.
Cobalt:				
Ore and concentrate		66,464	--	China 59,902; Singapore 4,562; Ethiopia 2,000.
Oxides and hydroxides		32,903	1,062	Germany 16,699; Italy 7,000; Morocco 5,000.
Metal, including alloys, all forms		35,043	--	Argentina 31,249; Israel 1,125; Tunisia 855.
Columbium and tantalum, metal, including alloys, all forms, tantalum		2,260	--	France 1,687; Brazil 304; United Kingdom 267.
Copper:				
Ore and concentrate		4,326,684	--	Canada 4,326,375; Chile 308; unspecified 1.
Matte and speiss, including cement copper		8,000	--	All to Brazil.
Oxides and hydroxides		342,763	--	Italy 288,062; France 23,710; Netherlands 19,000.
Sulfates		2,891,176	--	Portugal 990,062; France 724,125; Greece 631,062.
Ash and residue containing copper		50,034	--	Germany 35,437; Belgium 14,687.
Metal, including alloys:				
Scrap	metric tons	78,650	568	Germany 19,113; China 17,257; United Kingdom 14,960.
Unwrought		95,333,129	331	Belgium 33,603,104; Germany 6,870,224; France 6,483,771.
Semimanufactures:				
Powders and flakes		470,687	--	France 284,003; Mexico 70,507; United Kingdom 69,300.
Rods, bars, profiles		78,488,980	1,421,687	Germany 19,033,062; Spain 16,728,619; France 15,383,933.
Wire		92,977,959	23,687	Portugal 37,939,499; Italy 36,383,416; France 12,344,765.
Plates, sheets, strips		9,955,193	792,793	Portugal 3,923,046; Germany 687,359; Morocco 636,120.
Foil		5,522,407	164,363	Italy 2,310,749; Germany 987,608; France 659,527.
Tubes and pipes	metric tons	20,098	54	Algeria 3,765; United Kingdom 3,542; France 3,152.
Tube or pipe fittings	do.	9,934	150	France 2,381; Germany 1,549; United Kingdom 1,412.

See footnotes at end of table.

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TABLE 3--Continued
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS—Continued				
Gold:				
Waste and sweepings		3,409	41	Belgium 2,867; France 350; United Kingdom 134.
Metal, including alloys, unwrought and partly wrought		9,584	--	Switzerland 1,524; France 1,109; Portugal 1,094.
Iron and steel:				
Iron and concentrate:				
Including roasted pyrite	metric tons	180,035	(1)	Greece 118,039; Turkey 22,051; Tunisia 20,869.
Excluding roasted pyrite		259,074	347	Norway 252,203; Turkey 4,000; Hungary 2,000.
Pyrite, roasted	metric tons	179,776	--	Greece 118,039; Turkey 22,047; Tunisia 20,869.
Metal:				
Scrap	do.	198,547	622	France 76,119; Portugal 60,145; China 14,276.
Pig iron, cast iron, related materials		9,055,750	42,538	Portugal 2,865,124; Mexico 1,362,750; Germany 920,056.
Ferroalloys:				
Ferrochromium		550,673	--	Portugal 518,023; Luxembourg 25,000; Bulgaria 3,125.
Ferromanganese		85,415,128	3,054,000	Germany 25,278,187; Italy 15,120,600; Poland 7,650,000.
Ferromolybdenum		121,811	--	Netherlands 62,316; Portugal 37,058; Mauritania 11,937.
Ferronickel		16,500	--	All to Germany.
Ferrosilicomanganese	metric tons	40,130	2,600	Portugal 9,408; France 7,702; United Kingdom 6,895.
Ferrosilicon		116,713	--	Luxembourg 59,398; Portugal 31,570; India 21,058.
Ferrotungsten and ferrosilicotungsten		10,292	--	Luxembourg 10,000; Portugal 292.
Ferrotitanium and ferrosilicotitanium		80,440	--	Egypt 30,140; Brazil 28,613; Luxembourg 20,000.
Ferrovanadium		117,573	--	Netherlands 56,101; Portugal 45,160; United Kingdom 8,312.
Ferroniobium		1,149	--	Portugal 1,125; unspecified 24.
Silicon metal	metric tons	12,954	400	Germany 4,573; United Kingdom 3,219; Italy 2,776.
Unspecified		301,285	--	Mexico 82,367; Poland 59,804; Brazil 45,925.
Steel, primary forms	metric tons	132,228	62,564	Italy 23,993; China 8,436; France 6,722.
Semimanufactures:				
Flat-rolled products:				
Of iron or nonalloy steel:				
Not clad, plated, coated	do.	794,220	823	Italy 236,263; Portugal 195,444; France 175,880.
Clad, plated, coated	do.	713,545	4,295	France 186,204; Portugal 140,317; Italy 116,526.
Of alloy steel	do.	515,981	1,304	Italy 97,849; Germany 65,999; France 64,519.
Bars, rods, angles, shapes, sections	do.	3,224,264	105,905	Portugal 640,873; France 406,880; Germany 315,021.
Rails and accessories		87,971,466	8,754,617	Turkey 20,431,507; Bangladesh 18,198,003; Brazil 9,491,687.
Wire	metric tons	204,223	3,504	France 84,613; Germany 17,545; Portugal 16,492.
Tubes, pipes, fittings	do.	673,171	67,676	France 176,520; Portugal 115,181; Germany 56,286.
Lead:				
Ore and concentrate		6,057,158	--	China 6,048,078; Cuba 6,000; Ethiopia 3,000.
Oxides	metric tons	1,931	--	Portugal 535; United Kingdom 286; Morocco 234.
Metal, including alloys:				
Scrap		6,398,880	--	France 5,155,191; Portugal 391,812; Austria 371,125.
Unwrought		8,502,480	--	Portugal 5,870,698; France 1,000,937; Germany 759,726.
Semimanufactures		1,923,352	328	Netherlands 699,390; Belgium 551,562; France 485,375.
Lithium oxides and hydroxides		14,464	--	Belgium 10,000; Philippines 2,000; Dominican Republic 1,875.
Magnesium, metal, including alloys:				
Scrap		2,400,433	--	Norway 2,263,875; Germany 136,558.
Unwrought		421,751	140,476	Mexico 187,769; Norway 66,515; Portugal 26,445.
Semimanufactures		258,136	--	Portugal 83,597; France 51,585; unspecified Asia 98,140.
Manganese:				
Ore and concentrate	metric tons	989	--	United Kingdom 470; Czech Republic 336; Italy 129.
Oxides		2,824,179	42,000	China 1,920,000; Portugal 173,148; France 169,500.
Metal, including alloys, all forms		6,124,245	1,690,062	Germany 1,292,375; France 1,062,812; Australia 465,937.
Mercury		596,646	--	Iran 113,218; United Kingdom 86,843; India 66,480.

See footnotes at end of table.

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TABLE 3--Continued
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS—Continued				
Molybdenum:				
Ore and concentrate:				
Roasted		128,019	--	Netherlands 81,019; Germany 46,000; Italy 1,000.
Unroasted		5,706	--	Italy 5,625; Brazil 61; Israel 20.
Oxides and hydroxides		199	--	All to Italy.
Metal, including alloys:				
Scrap and unwrought		12,288	--	Brazil 11,187; Portugal 1,000; Hungary 101.
Semimanufactures		5,541	30	Portugal 2,503; Germany 1,260; Argentina 554.
Nickel:				
Ore and concentrate		148	--	All to Mexico.
Matte and speiss		250	--	All to France.
Oxides and hydroxides		1,364	--	Portugal 824; Germany 500; France 40.
Metal, including alloys:				
Scrap		508,773	142,718	Japan 120,000; United Kingdom 79,128; Italy 75,222.
Unwrought		177,106	2,187	Portugal 120,660; Germany 27,500; Malaysia 17,343.
Semimanufactures		128,831	626	Ireland 39,648; Germany 24,351; Chile 16,386.
Platinum-group metals:				
Waste and sweepings		1,893	1,800	United Kingdom 57; France 36.
Metal, including alloys, unwrought and partly wrought:				
Palladium	value	$862,771	$2,487	Portugal $453,973; France $292,163; Netherlands $24,762.
Platinum	value, thousands	$7,900	$2	France $6,260; United Kingdom $1,450; Italy $79.
Rhodium	value	$200,235	--	United Kingdom $180,275; Italy $13,288; Portugal $6,358.
Iridium, osmium, ruthenium		832	--	Switzerland 98; Singapore 10; Poland 3.
Rare-earth metals, including alloys, all forms		628	367	Indonesia 199; India 50; unspecified 12.
Selenium, elemental		537	--	Portugal 523; unspecified 14.
Silicon, high-purity		74,513	--	Italy 48,000; Portugal 26,371; Malta 97.
Silver, metal, including alloys, unwrought and partly wrought	value	$56,724,304	$345,888	France $17,595,053; Italy $13,351,345; Portugal $7,562,723.
Tin:				
Ore and concentrate		50,229	460	Poland 35,031; Belgium 14,687; unspecified 51.
Metal, including alloys:				
Scrap		220,895	--	Belgium 189,863; Netherlands 29,820; Germany 1,187.
Unwrought		165,034	--	Portugal 100,203; Turkey 24,980; Italy 12,988.
Semimanufactures		91,088	--	United Kingdom 60,632; Qatar 9,312; Mexico 8,562.
Titanium:				
Ore and concentrate		624,307	--	Portugal 248,000; Mexico 131,351; China 102,300.
Oxides		728,849	--	Belgium 166,988; China 160,058; Morocco 126,300.
Metal, including alloys:				
Powders, unwrought, scrap		967	--	Portugal 398; Malta 199; France 148.
Semimanufactures		481,677	35,687	United Kingdom 176,499; Italy 89,812; Germany 69,421.
Tungsten:				
Ore and concentrate		16,921,570	--	All to Greece.
Metal, including alloys:				
Scrap and unwrought		57,384	8,500	Netherlands 25,683; Italy 7,625; Germany 7,750.
Semimanufactures		80,306	526	United Kingdom 62,209; Netherlands 7,937; Germany 2,811.
Uranium and thorium:				
Oxides and other compounds		68,066	720	France 57,744; Portugal 8,805; United Kingdom 775.
Metal, including alloys, all forms, thorium		67,353	7	Do.
Vanadium, oxides and hydroxides		9,764	--	Mexico 5,562; Austria 3,312; Andorra 742.
Zinc:				
Ore and concentrate		38,097,599	--	Belgium 20,747,898; Germany 11,332,437; France 4,754,679.
Oxides		17,145,260	--	Netherlands 3,750,375; Portugal 3,520,750; Italy 3,410,562.

See footnotes at end of table.

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TABLE 3--Continued
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
METALS—Continued				
Zinc—Continued:				
Blue powder		200,567	--	Brazil 200,019; Poland 500; unspecified 48.
Ash and residue containing zinc		235,666	57,609	Portugal 335,675; South Africa 192,976; Turkey 20,140.
Metal, including alloys:				
Scrap		5,142,017	--	China 2,495; Portugal 1,118,312; Italy 351,062.
Unwrought	metric tons	349,145	--	Italy 116,030; Netherlands 84,757; Germany 77,688.
Semimanufactures		698,326	82	China 351,812; Portugal 241,173; India 49,500.
Zirconium:				
Ore and concentrate	metric tons	11,003	80	United Arab Emirates 3,367; Turkey 1,375; Indonesia 1,171.
Metal, including alloys:				
Scrap and unwrought		148,261	--	Brazil 120,000; Algeria 16,199; Russia 12,062.
Semimanufactures		840,318	--	Indonesia 552,000; Brazil 256,000; Venezuela 14,000.
Other, ash and residue		2,627,397	93,609	Italy 1,101,687; Japan 382,125; Portugal 335,675.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc.		6,939,528	2,625	Cuba 3,020,125; France 1,409,252; Germany 987,000.
Artificial:				
Corundum		859,696	--	Italy 680,125; Portugal 63,218; France 58,335.
Silicon carbide		4,866,489	192,371	United Kingdom 1,052,500; Italy 960,000; Portugal 532,937.
Dust and powder of precious and semiprecious stones, including diamond	value	$2,208,942	$13,654	Portugal $869,993; Italy $778,881; Germany $330,017.
Grinding and polishing wheels and stones		6,979,023	318,947	Portugal 1,187,951; Germany 1,082,448; France 680,966.
Barite and witherite		33,929,917	--	Italy 14,484,863; France 7,850,519; Belgium 4,006,375.
Boron materials:				
Crude natural borates		7,185,051	--	Republic of Korea 4,011,000; India 1,449,000; Brazil 931,687.
Oxides and acids		4,248,155	--	Italy 2,653,062; France 929,375; Greece 167,640.
Cement	metric tons	1,753,034	328,650	France 505,903; Portugal 253,192; United Kingdom 205,276.
Chalk	do.	106,050	380	Germany 28,684; France 23,493; Morocco 13,605.
Clays, crude:				
Bentonite	do.	81,710	1	United Kingdom 24,691; Germany 15,354; France 11,689.
Chamotte earth and Dinas earth		1,422,997	--	Andorra 881,187; Morocco 298,000; Algeria 181,519.
Fire clay		2,927,820	--	Portugal 1,167,375; France 831,875; Italy 356,000.
Fuller's earth	metric tons	11,362	--	Germany 5,462; Netherlands 2,308; Argentina 1,164.
Kaolin	do.	151,467	--	Italy 30,696; France 27,675; United Kingdom 24,421.
Unspecified	do.	23,446	133	Portugal 11,265; France 5,101; Republic of Korea 2,226.
Diamond, natural:				
Gem, not set or strung	value	$5,112,874	$7,781	Belgium $1,932,428; Andorra $933,012; Portugal $693,800.
Industrial stones	do.	$394,656	$9,555	Italy $248,254; Poland $60,159; Belgium $34,225.
Dust and powder	do.	$2,208,942	$13,654	Portugal $869,993; Italy $778,881; Germany $330,017.
Diatomite and other infusorial earth		5,256,489	101,871	Portugal 1,463,250; Italy 1,308,000; France 822,125.
Feldspar		72,058,129	--	Portugal 39,075,359; Turkey 9,493,199; Italy 7,469,597.
Fertilizer materials:				
Crude, n.e.s.		35,263,016	--	Indonesia 12,506,296; Portugal 7,639,667; Italy 6,112,058.
Manufactured:				
Ammonia		49,705,456	--	France 24,399,707; Morocco 8,766,617; Senegal 5,314,722.
Nitrogenous	metric tons	453,314	168	France 111,269; Ireland 96,632; Portugal 48,880.
Phosphatic		1,467,477	--	Portugal 881,062; Italy 445,812; Chile 40,160.
Potassic	metric tons	680,201	--	France 311,360; Brazil 97,429; Netherlands 86,562.
Unspecified and mixed	do.	1,314,009	1,008	France 454,716; Portugal 176,870; Italy 113,752.
Fluorspar		2,221,068	--	Portugal 2,221,000; Japan 44; unspecified 24.
Graphite, natural		27,634,380	1	Italy 19,023,750; France 8,542,300; Switzerland 20,398.
Gypsum and plaster	metric tons	3,369,337	789,300	United Kingdom 784,611; France 312,118; Portugal 248,676.
Iodine		31,140	--	Germany 25,656; Lithuania 2,062; United Kingdom 1,062.

See footnotes at end of table.

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TABLE 3--Continued
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
INDUSTRIAL MINERALS—Continued				
Kyanite and related materials:				
Andalusite, kyanite, sillimanite		25,624	--	Italy 11,562; Portugal 10,250; Russia 2,000.
Mullite		24,487	--	France 22,101; Italy 2,187; unspecified 199.
Unspecified		50,111	--	France 22,101; Italy 13,749; Portugal 10,250.
Lime		97,972,538	--	France 77,966,632; Portugal 6,780,917; Nigeria 2,482,625.
Magnesium compounds:				
Magnesite, crude		25,557,097	--	Canada 24,361,878; France 451,375; Poland 327,687.
Oxides and hydroxides	metric tons	422,319	--	United Kingdom 269,349; France 79,920; Netherlands 14,665.
Other		237,648	--	Portugal 187,648; Belgium 26,000; Morocco 24,000.
Mica:				
Crude, including splittings and waste		3,074,519	--	United Kingdom 1,897,312; France 793,625; Italy 176,613.
Worked, including agglomerated splittings		25,828	--	Argentina 4,750; Portugal 3,757; France 3,625.
Nitrates, crude		327,402	--	Belgium 180,500; Morocco 42,000; Turkey 41,808.
Phosphates, crude		7,034	2,000	China 3,000; Portugal 1,937; unspecified 97.
Phosphorus, elemental		1	--	Unspecified 1.
Pigments, mineral, iron oxides and hydroxides, processed		15,600,256	695,875	Italy 3,183,487; Portugal 1,767,437; France 1,464,937.
Potassium salts, crude		6	--	All to Slovenia.
Precious and semiprecious stones other than diamond:				
Natural	value, thousands	$1,114	$162	United Arab Emirates $323; Colombia $249; Germany $73.
Synthetic	value	$1,878,339	$18,520	Germany $518,075; Morocco $308,288; Portugal $276,078.
Pyrite, unroasted		55,739	--	Israel 47,000; Poland 4,000; Morocco 2,500.
Quartz crystal, piezoelectric	value	$308	--	Unspecified $308.
Salt and brine	metric tons	745,478	632	France 285,348; Norway 163,435; United Kingdom 86,516.
Sodium compounds, n.e.s., natural and/or manufactured, sulfate	do.	816,543	2	Italy 164,712; Brazil 150,162; United Kingdom 93,976.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	do.	1,376,801	70,285	China 308,063; Italy 161,220; France 59,125.
Worked	do.	1,158,737	96,631	France 338,986; United Kingdom 163,232; Germany 137,387.
Dolomite, chiefly refractory-grade	do.	183,014	17,201	United Kingdom 85,297; France 27,130; Portugal 13,454.
Gravel and crushed rock	do.	941,605	238	Portugal 345,433; Andorra 298,430; France 241,988.
Limestone other than dimension	do.	122,032	--	Belgium 121,172; Indonesia 344; China 210.
Quartz and quartzite	do.	389,669	--	Norway 317,608; Iceland 30,183; Canada 17,102.
Sand other than metal-bearing	do.	1,756,885	--	Portugal 905,117; Andorra 579,790; Italy 181,673.
Sand and gravel	do.	2,698,491	238	Portugal 1,250,551; Andorra 878,219; France 282,316.
Sulfur:				
Elemental:				
Crude, including native and byproduct		53,873,597	--	Netherlands 16,721,062; Niger 7,051,339; Brazil 6,310,257.
Colloidal, precipitated, sublimed		98,678	--	Portugal 39,109; Germany 26,679; Cuba 10,500.
Dioxide		637,968	--	Portugal 546,375; Belgium 69,152; Italy 22,441.
Sulfuric acid	metric tons	292,996	--	Portugal 91,247,375; Brazil 61,981,789; Morocco 53,210,730.
Talc, steatite, soapstone, pyrophyllite		60,859,715	2,687	Belgium 24,751,148; Portugal 13,556,089; Italy 7,086,085.
Vermiculite, perlite, chlorite		1,440,765	--	France 355,250; Portugal 271,437; Italy 216,179.
Other, slag and dross, not metal-bearing	metric tons	433,314	36,134	Portugal 374,175; France 8,567; Canada 7,734.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural		6,302,642	--	Andorra 4,683,730; Portugal 1,170,812; Cuba 116,000.
Carbon black		16,541,065	--	Portugal 5,886,054; France 5,374,015; Italy 2,001,375.
Coal:				
Anthracite		48,709,710	--	Portugal 18,938,250; France 17,948,960; Venezuela 8,271,835.
Bituminous	metric tons	14,638	--	United Kingdom 9,200; Portugal 3,818; Tunisia 809.
Briquets of anthracite and bituminous coal		33,000	--	All to Portugal.

See footnotes at end of table.

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TABLE 3--Continued
SPAIN: EXPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Destinations	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS—Continued				
Coal—Continued:				
Lignite, including briquets		20,640	--	All to Morocco.
All grades, including briquets	metric tons	63,401	--	Portugal 22,789; France 18,758; United Kingdom 12,031.
Coke and semicoke	do.	985,408	--	Germany 418,456; France 262,596; Brazil 161,463.
Gas, manufactured		753	--	Portugal 656; Cuba 70; unspecified 27.
Gas, natural:				
Gaseous	metric tons	2,041,369	--	Portugal 2,041,369; unspecified.[1]
Liquefied	do.	181,720	140,006	Republic of Korea 39,191; Portugal 2,522.
Peat, including briquets and litter		5,228,949	--	Portugal 2,577,187; France 1,186,000; Germany 695,750.
Petroleum:				
Crude		5,252	--	Algeria 60; unspecified 5,192.
Refinery products:				
Liquefied petroleum gas	metric tons	307,841	18,643	Morocco 147,517; Portugal 57,981; United Kingdom 20,064.
Mineral jelly and wax		38,902,031	1,376,125	Portugal 11,971,066; Italy 4,427,194; France 3,462,312.
Asphalt	metric tons	880,029	--	France 269,721; Portugal 264,314; Algeria 121,066.
Bitumen and other residues	do.	880,055	--	France 269,721; Portugal 264,340; Algeria 121,066.
Bituminous mixtures		67,143,735	--	Portugal 65,744,125; France 1,053,062; Italy 82,390.
Petroleum coke	metric tons	170,408	--	Portugal 115,983; Venezuela 53,062; Italy 82,390.

-- Zero.

[1]Less than ½ unit.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed online at URL http://unstats.un.org/unsd/comtrade.

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TABLE 4
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals		119,735	3	China 90,000; Germany 10,585; France 10,276.
Alkaline-earth metals		644,969	--	Russia 219,949; China 209,699; Germany 164,089.
Aluminum:				
Ore and concentrate	metric tons	3,329,441	(1)	Guinea 3,177,042; Greece 51,423; China 42,708.
Oxides and hydroxides	do.	85,152	544	Germany 36,373; France 35,424; Netherlands 4,944.
Ash or residue containing aluminum		64,130,394	24,136	France 27,781,707; Italy 13,646,621; Germany 6,464,730.
Metal, including alloys:				
Scrap		85,980,552	18,363	France 46,771,273; Portugal 19,397,707; Germany 4,013,062.
Unwrought	metric tons	328,782	(1)	Portugal 85,669; Mozambique 82,456; Norway 47,009.
Semimanufactures:				
Powders and flakes	do.	3,011	14	Germany 1,115; South Africa 680; United Kingdom 601.
Rods, bars, profiles		46,023,366	915,339	Venezuela 7,950,074; France 7,247,686; Italy 7,042,847.
Wire		41,928,586	56,620	Brazil 11,829,526; Venezuela 7,361,726; France 6,762,901.
Plates, sheets, strips	metric tons	138,052	26,565	Germany 38,019; Italy 16,966; France 14,234.
Foil		44,648,938	50,269	Germany 10,026,375; France 5,489,811; Greece 4,078,187.
Tubes and pipes	metric tons	18,144	629	Germany 3,678; United Kingdom 3,193; Italy 3,069.
Tube or pipe fittings		966,160	3,500	Germany 239,359; Italy 163,152; Portugal 153,277.
Antimony:				
Ore and concentrate		104,644	--	Italy 54,195; China 22,000; Germany 18,375.
Oxides		5,701,040	--	France 5,265,300; Belgium 136,531; China 100,000.
Metal, including alloys, all forms		2,269,608	--	China 2,041,250; Netherlands 119,976; Vietnam 60,000.
Arsenic, metal, including alloys, all forms		91,812	--	China 89,000; France 2,812.
Beryllium, metal, including alloys, all forms		7,638	585	Italy 5,625; France 1,375; Brazil 53.
Bismuth, metal, including alloys, all forms		206,180	3	Belgium 167,914; United Kingdom 13,937; Germany 11,562.
Cadmium, metal, including alloys, all forms		21,660	--	Mexico 20,000; France 808; United Kingdom 695.
Chromium:				
Ore and concentrate		3,946,600	--	Pakistan 1,019,750; France 1,006,750; South Africa 679,062.
Oxides and hydroxides	metric tons	10,883	(1)	China 3,432; United Kingdom 3,279; Russia 2,224.
Metal, including alloys, all forms		1,519,610	854	Portugal 643,062; Russia 569,687; Japan 230,941.
Cobalt:				
Ore and concentrate		8,331	3	Germany 8,125; Belgium 199; unspecified 4.
Oxides and hydroxides		1,241,580	--	China 457,687; United Kingdom 258,750; Finland 224,734.
Metal, including alloys, all forms		180,760	8,511	Germany 52,191; France 38,910; Belgium 32,378.
Columbium and tantalum, metal, including alloys, all forms, tantalum		3,572	1,062	Germany 1,753; Italy 390; United Kingdom 265.
Copper:				
Ore and concentrate	metric tons	776,980	(1)	Indonesia 269,265; Chile 234,853; Portugal 102,493.
Matte and speiss, including cement copper		95,761	--	Finland 66,574; Germany 14,562; France 13,312.
Oxides and hydroxides		952,025	89,554	Peru 158,000; Norway 144,000; France 107,027.
Sulfates		2,982,609	203	Italy 968,187; France 627,750; Russia 360,437.
Ash and residue containing copper	metric tons	24,652	4,408	Italy 10,774; Belgium 3,597; United Kingdom 1,899.
Metal, including alloys:				
Scrap	do.	115,038	4,982	Portugal 58,075; France 24,265; Germany 8,460.
Unwrought		82,574,092	498,405	Chile 62,922,303; France 6,605,473; Finland 3,451,144.
Semimanufactures:				
Powders and flakes		1,861,736	1,507	Italy 1,081,312; France 420,624; United Kingdom 187,136.
Rods, bars, profiles		36,734,627	32,323	Germany 15,101,791; France 7,583,003; Spain 3,981,343.
Wire		90,699,993	385,733	France 33,887,220; Italy 25,077,497; Belgium 21,639,148.
Plates, sheets, strips		28,425,673	214,810	Germany 18,869,946; Italy 3,899,645; France 2,276,075.
Foil	metric tons	15,319	8	Italy 3,407; Republic of Korea 2,977; China 1,869.
Tubes and pipes		57,279,474	575,812	Italy 19,243,175; Greece 13,394,573; Germany 8,317,975.
Tube or pipe fittings		13,317,807	347,281	Italy 4,708,750; France 2,072,577; Germany 1,527,999.

See footnotes at end of table.

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TABLE 4--Continued
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS—Continued				
Gold:				
Waste and sweepings		7,343	8	Portugal 5,242; Italy 1,985; Germany 108.
Metal, including alloys, unwrought and partly wrought		35,416	71	Switzerland 22,938; Russia 4,956; Germany 3,403.
Iron and steel:				
Iron and concentrate:				
Including roasted pyrite	metric tons	6,183,146	(1)	Brazil 4,329,346; Venezuela 649,484; Mauritania 568,117.
Excluding roasted pyrite	do.	6,182,975	(1)	Brazil 4,329,175; Venezuela 649,484; Mauritania 568,117.
Pyrite, roasted		171,211	199	Brazil 171,000; Italy 10; unspecified 2.
Metal:				
Scrap	thousand metric tons	6,982	23	United Kingdom 2,215; France 1,422; Russia 1,283.
Pig iron, cast iron, related materials	metric tons	1,239,681	3,790	Russia 519,642; Brazil 126,845; Sweden 123,078.
Ferroalloys:				
Ferrochromium	metric tons	217,399	--	South Africa 128,674; Kazakhstan 46,705; Zimbabwe 20,401.
Ferromanganese		20,848,737	--	Norway 7,432,683; France 6,469,480; South Africa 3,361,000.
Ferromolybdenum		3,662,986	--	United Kingdom 1,798,562; Chile 494,500; Armenia 376,500.
Ferronickel	metric tons	58,641	(1)	New Caledonia 20,813; Greece 13,098; Colombia 12,622.
Ferrosilicochromium		48,060	--	Russia 48,000; United Kingdom 60.
Ferrosilicomanganese	metric tons	74,787	18	Norway 17,626; China 15,524; South Africa 11,886.
Ferrosilicon		9,413,235	18,011	Argentina 3,268,187; Norway 2,897,812; Brazil 889,250.
Ferrotungsten and ferrosilicotungsten		127,077	--	China 41,476; Netherlands 34,914; Luxembourg 30,000.
Ferrotitanium and ferrosilicotitanium		1,228,225	--	United Kingdom 733,000; Germany 194,621; France 168,144.
Ferrovanadium		1,133,060	--	Russia 315,000; Netherlands 258,750; South Africa 172,355.
Ferroniobium		514,827	--	Brazil 266,375; Netherlands 130,199; Germany 118,000.
Silicon metal		5,355,008	--	France 1,797,250; South Africa 1,148,375; China 1,133,000.
Unspecified		11,041,892	18,335	France 3,732,937; China 2,364,437; Slovenia 1,443,375.
Steel, primary forms	metric tons	1,494,429	5,048	France 614,473; Portugal 170,446; Turkey 168,276.
Semimanufactures:				
Flat-rolled products:				
Of iron or nonalloy steel:				
Not clad, plated, coated	do.	3,901,512	470	France 657,081; Italy 534,048; Germany 532,845.
Clad, plated, coated	do.	2,074,777	4,903	Germany 477,437; Italy 297,909; France 295,202.
Of alloy steel	do.	1,364,381	2,134	France 946,021; Germany 153,195; Italy 46,186.
Bars, rods, angles, shapes, sections	do.	2,291,560	734	Portugal 513,053; Turkey 493,498; United Kingdom 145,754.
Rails and accessories	do.	20,788	--	France 6,674; Germany 3,220; Luxembourg 2,166.
Wire	do.	180,627	74	Italy 62,464; France 28,468; Germany 24,696.
Tubes, pipes, fittings	do.	740,331	2,953	Italy 145,628; France 112,986; Germany 87,558.
Lead:				
Ore and concentrate		1,845,197	--	Ghana 919,875; Nigeria 705,062; Morocco 88,000.
Oxides		4,825,737	--	Italy 1,496,539; Belgium 529,000; United Kingdom 102,062.
Metal, including alloys:				
Scrap		27,866,519	--	France 12,113,914; Portugal 8,905,039; Nigeria 2,748,500.
Unwrought	metric tons	153,103	428	Morocco 29,534; Belgium 24,627; Peru 20,196.
Semimanufactures		3,013,517	7,063	France 1,035,311; Portugal 689,437; Netherlands 570,187.
Lithium oxides and hydroxides		329,296	17,503	China 125,000; Germany 110,980; Belgium 66,000.
Magnesium, metal, including alloys:				
Unwrought		1,952,457	--	China 649,500; Netherlands 521,437; Germany 266,109.
Semimanufactures		4,508,235	24,242	Norway 3,660,750; Israel 256,187; France 160,546.
Manganese:				
Ore and concentrate	metric tons	574,929	25	South Africa 260,913; Gabon 153,417; Brazil 62,614.
Oxides		5,831,722	1,812	South Africa 2,089,500; India 1,364,000; Germany 526,623.
Metal, including alloys, all forms		9,800,895	304	China 9,053,824; Netherlands 308,562; Germany 266,625.
Mercury		301,089	23,699	Switzerland 122,835; Netherlands 53,238; Peru 45,152.

See footnotes at end of table.

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TABLE 4--Continued
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS—Continued				
Molybdenum:				
Ore and concentrate:				
Roasted		3,775,538	287,375	Mexico 1,481,812; Netherlands 843,375; Chile 797,875.
Unroasted		87,328	16,328	Germany 48,000; Netherlands 22,000; Italy 1,000.
Oxides and hydroxides		37,634	--	United Kingdom 24,550; Germany 11,937; Italy 699.
Metal, including alloys:				
Scrap and unwrought		17,917	4,125	Germany 10,134; France 1,875; China 1,500.
Semimanufactures		11,774	1,135	Netherlands 3,051; Paraguay 3,000; Germany 2,593.
Nickel:				
Ore and concentrate		6,502	--	Italy 5,750; Netherlands 750; unspecified 2.
Matte and speiss		8,562	--	Canada 8,125; Germany 437.
Oxides and hydroxides		203,647	--	Cuba 65,425; Netherlands 62,476; Finland 16,648.
Metal, including alloys:				
Scrap		91,408	--	Portugal 39,898; Brazil 34,281; France 16,679.
Unwrought	metric tons	28,264	136	Australia 10,722; Russia 6,480; Netherlands 3,988.
Semimanufactures		2,041,126	100,190	United Kingdom 409,009; Belgium 221,671; Sweden 178,254.
Platinum-group metals:				
Waste and sweepings		298	--	Portugal 200; France 98.
Metal, including alloys, unwrought and partly wrought:				
Palladium		1,082	520	Switzerland 341; France 129; Germany 33.
Platinum	value, thousands	$22,722	$40	United Kingdom $7,108; France $6,711; Switzerland $6,679.
Rhodium	value	$629,998	--	United Kingdom $521,472; Germany $56,223; Italy $39,646.
Iridium, osmium, ruthenium	do.	$74,502	--	United Kingdom $48,139; Italy $17,503; Australia $3,936.
Rare-earth metals, including alloys, all forms		84,662	3	China 76,000; United Kingdom 7,750; Italy 707.
Selenium, elemental		50,027	--	France 14,312; Germany 11,437; Netherlands 3,625.
Silicon, high-purity	metric tons	307	(1)	United Arab Emirates 116; Philippines 88; Netherlands 44.
Silver:				
Ore and concentrate		54,306	--	Indonesia 17,423; Chile 10,825; France 10,000.
Metal, including alloys, unwrought and partly wrought		176,098	104,936	Switzerland 18,237; Germany 13,893; Netherlands 13,097.
Tin:				
Ore and concentrate		159,898	--	United Kingdom 120,000; Netherlands 39,898.
Metal, including alloys:				
Scrap		2,265,719	24,097	Portugal 2,167,125; France 53,496; Italy 15,875.
Unwrought		8,155,512	23	Peru 2,277,437; Indonesia 2,061,562; Malaysia 1,554,347.
Semimanufactures		532,591	3,191	France 193,542; Germany 188,574; Italy 112,128.
Titanium:				
Ore and concentrate	metric tons	174,749	(1)	Australia 172,362; Ukraine 724; South Africa 465.
Oxides		19,769,174	4,396,175	China 5,601,851; Netherlands 3,540,062; Germany 2,308,375.
Metal, including alloys:				
Powders, unwrought, scrap		514,629	757	Russia 314,562; United Kingdom 82,722; Germany 61,308.
Semimanufactures		3,301,480	481,792	Belgium 1,731,437; Russia 442,625; Germany 265,288.
Tungsten:				
Ore and concentrate		949	--	France 500; Czech Republic 449.
Metal, including alloys:				
Scrap and unwrought		12,379	6,141	China 2,815; Austria 1,250; Netherlands 988.
Semimanufactures		247,076	20,319	Portugal 98,425; Italy 98,280; Germany 9,565.
Uranium and thorium:				
Oxides and other compounds		303,386	--	United Kingdom 274,678; Italy 25,201; Portugal 2,000.
Metal, including alloys, all forms:				
Uranium		3	3	None.
Thorium		29,723	--	Italy 25,201; Portugal 2,000; France 1,178.

See footnotes at end of table.

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TABLE 4--Continued
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
METALS—Continued				
Vanadium:				
Oxides and hydroxides		118,268	2	Germany 60,765; United Kingdom 52,500; Belgium 5,000.
Metal, including alloys, all forms		5,221	--	China 5,000; Netherlands 199; Germany 16.
Zinc:				
Ore and concentrate	metric tons	864,143	157,614	Peru 240,097; Ireland 176,305; Canada 114,123.
Oxides		59,416,318	123,007	China 12,767,617; Italy 9,806,406; Netherlands 8,361,539.
Blue powder		1,627,926	5,000	Belgium 1,038,062; Denmark 409,312; Germany 116,003.
Ash and residue containing zinc		8,113,478	--	Portugal 2,447,562; Germany 2,358,937; France 1,251,195.
Metal, including alloys:				
Scrap		4,195,961	--	Italy 1,434,562; France 1,211,625; Australia 438,250.
Unwrought	metric tons	17,720	--	Belgium 13,118; Netherlands 1,379; United Kingdom 1,276.
Semimanufactures		6,064,547	222	France 2,873,705; Germany 1,713,647; Italy 398,155.
Zirconium:				
Ore and concentrate	metric tons	142,853	1,956	South Africa 86,764; Australia 49,464; Ukraine 2,366.
Metal, including alloys:				
Scrap and unwrought		246	39	Switzerland 128; Germany 66; unspecified 13.
Semimanufactures		93,464	22,625	Netherlands 36,601; Germany 17,203; Israel 9,812.
Other, ash and residue		97,255,438	4,432,475	France 29,5639,507; Italy 25,355,412; Germany 8,893,834.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc.		5,278,209	4,177	India 2,134,062; Turkey 859,750; Australia 735,500.
Artificial:				
Corundum		22,362,819	--	China 8,129,136; France 5,256,296; Germany 2,398,562.
Silicon carbide	metric tons	8,663	(1)	Venezuela 2,522; Norway 1,822; Netherlands 1,205.
Dust and powder of precious and semiprecious stones, including diamond	value	$16,325,075	$393,239	Ireland $10,788,971; Belgium $3,935,280; Italy $319,751.
Grinding and polishing wheels and stones		12,091,365	23,526	Italy 3,320,186; Germany 2,903,256; China 1,147,452.
Asbestos, crude		192,171	--	Germany 3,500; unspecified 188,671.
Barite and witherite		59,387,160	--	Morocco 29,688,300; China 28,071,800; Netherlands 837,000.
Boron materials:				
Crude natural borates		63,007,123	--	Turkey 59,251,000; Argentina 3,479,249; Chile 224,000.
Oxides and acids		31,276,914	--	Chile 4,270,000; Turkey 3,418,250; Bolivia 1,620,000.
Cement	metric tons	8,767,359	--	Egypt 3,472,876; Portugal 1,373,143; Turkey 1,262,719.
Chalk		7,077,001	--	France 4,902,925; Portugal 1,470,687; Netherlands 561,250.
Clays, crude:				
Bentonite		60,560,107	35,847	Italy 22,155,066; Greece 17,220,257; Germany 7,506,113.
Chamotte earth and Dinas earth		33,567,984	7,916,109	Ukraine 16,008,000; France 6,198,218; Germany 3,272,875.
Fire clay		98,551,304	--	Ukraine 93,281,875; France 2,207,687; Turkey 2,191,625.
Fuller's earth		270,673	--	Malaysia 120,000; Turkey 100,000; Portugal 48,398.
Kaolin	metric tons	1,219,340	17,593	Ukraine 554,030; United Kingdom 370,316; Turkey 99,320.
Unspecified	do.	35,425	703	United Kingdom 8,391; Ukraine 8,041; Portugal 6,797.
Diamond, natural:				
Gem, not set or strung	value	$86,131,064	$142,801	Belgium $66,837,074; India $8,738,437; Israel $6,122,548.
Industrial stones	value, thousands	$2,616	$38	Belgium $1,745; Ireland $366; United Kingdom $199.
Dust and powder	value	$16,304,507	$390,443	Ireland $10,788,971; Belgium $3,935,280; Italy $319,751.
Diatomite and other infusorial earth		7,165,642	3,684,187	France 2,285,812; Cuba 780,000; Germany 261,125.
Feldspar	metric tons	961,345	--	Turkey 692,280; Italy 186,035; France 77,619.
Fertilizer materials:				
Crude, n.e.s.		23,737,538	128,261	France 6,134,750; Italy 5,781,562; Germany 4,227,476.
Manufactured:				
Ammonia	metric tons	511,552	--	Algeria 146,706; Ukraine 123,332; Netherlands 107,205.
Nitrogenous	do.	1,352,236	79	Russia 306,667; Netherlands 143,912; Portugal 128,405.
Phosphatic	do.	101,139	--	Portugal 33,045; Tunisia 23,118; France 15,956.

See footnotes at end of table.

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TABLE 4--Continued
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
INDUSTRIAL MINERALS—Continued				
Fertilizer materials—Continued:				
Manufactured—Continued:				
Potassic	metric tons	339,161	1	Jordan 97,466; Israel 82,171; Canada 54,752.
Unspecified and mixed	do.	2,818,056	572	Russia 378,146; Portugal 305,971; Belgium 261,866.
Fluorspar		15,005,837	--	Mexico 9,416,250; China 2,500,875; Netherlands 2,480,875.
Graphite, natural		9,383,534	237,480	China 5,162,699; Germany 1,491,968; Canada 1,152,312.
Gypsum and plaster		57,501,134	261,360	Morocco 43,202,953; France 9,404,816; Germany 2,047,921.
Iodine		712,437	333,562	Japan 216,500; Portugal 132,699; Chile 16,000.
Kyanite and related materials:				
Andalusite, kyanite, sillimanite	metric tons	13,511	504	South Africa 10,623; France 2,222; Netherlands 96.
Mullite		1,750,823	4,562	Germany 889,125; China 780,687; Hungary 33,199.
Unspecified	metric tons	15,262	509	South Africa 10,623; France 2,222; Germany 908.
Lime		2,991,065	--	Portugal 1,351,690; Belgium 846,812; Germany 405,210.
Magnesium compounds:				
Magnesite, crude		2,915,783	--	Italy 2,175,437; Turkey 562,125; Israel 143,433.
Oxides and hydroxides	metric tons	102,426	245	Netherlands 34,682; China 28,755; Ireland 8,818.
Other		13,623,882	--	Germany 12,769,882; India 830,000; Netherlands 24,000.
Mica:				
Crude, including splittings and waste		1,620,064	32,246	India 623,437; Italy 217,683; France 191,448.
Worked, including agglomerated splittings		430,555	125	China 191,839; Belgium 149,804; Austria 40,562.
Nitrates, crude		9,020,263	--	China 7,918,011; Germany 1,077,687; Belgium 24,000.
Phosphates, crude	metric tons	1,800,252	4	Morocco 1,684,824; Algeria 74,618; Tunisia 23,270.
Phosphorus, elemental		8,238	--	Italy 7,375; Germany 859; Japan 3.
Pigments, mineral, iron oxides and hydroxides, processed		32,991,287	42,086	China 18,984,163; Germany 7,057,269; Brazil 1,694,812.
Potassium salts, crude		84	6	Philippines 78.
Precious and semiprecious stones other than diamond:				
Natural	value	$9,553,891	$255,970	Thailand $2,294,697; Brazil $1,359,965; India $1,327,432.
Synthetic	value, thousands	$6,125	$38	Switzerland $2,739; China $1,048; Germany $480.
Pyrite, unroasted		1,065,875	--	China 642,250; Brazil 320,687; Italy 72,000.
Quartz crystal, piezoelectric	value	$1,149,079	$36,182	Japan $881,389; Italy $202,977; Germany $20,833.
Salt and brine	metric tons	36,153	137	Algeria 11,478; France 8,879; United Kingdom 6,644.
Sodium compounds, n.e.s., natural and/or manufactured, sulfate		396,282	--	France 241,054; Germany 130,976; Italy 24,035.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	metric tons	1,195,339	469	Portugal 259,564; India 127,231; Brazil 120,771.
Worked	do.	259,449	145	Italy 60,230; China 53,482; Portugal 34,236.
Dolomite, chiefly refractory-grade		5,616,599	1,437	Portugal 2,946,374; France 831,882; Italy 830,718.
Gravel and crushed rock	metric tons	304,660	743	Morocco 196,525; France 71,778; Italy 2,752.
Limestone other than dimension		3,386	--	Portugal 1,000; Bulgaria 386; unspecified 2,000.
Quartz and quartzite		25,633,755	1	Brazil 18,590,190; China 1,864,000; India 1,832,132.
Sand other than metal-bearing	metric tons	1,306,610	248	Morocco 962,544; France 89,550; Portugal 59,122.
Sand and gravel	do.	1,611,270	991	Morocco 1,159,069; France 161,328; Portugal 87,525.
Sulfur:				
Elemental:				
Crude, including native and byproduct	do.	234,621	--	France 118,165; Germany 51,293; Kazakhstan 33,800.
Colloidal, precipitated, sublimed		540,355	--	Algeria 300,000; France 198,687; Germany 31,660.
Dioxide		5,529,805	--	Germany 5,130,351; Sweden 283,937; Italy 103,015.
Sulfuric acid	metric tons	229,394	(1)	Italy 110,142; France 33,083; Germany 28,524.
Talc, steatite, soapstone, pyrophyllite		80,648,953	371,875	France 37,125,945; Italy 18,020,171; China 12,228,097.
Vermiculite, perlite, chlorite		92,007,827	5,437	Greece 41,821,234; Turkey 32,607,000; China 10,992,058.
Other, slag and dross, not metal-bearing	metric tons	385,396	61	France 114,045; Turkey 71,815; United Kingdom 60,496.

See footnotes at end of table.

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TABLE 4--Continued
SPAIN: IMPORTS OF SELECTED MINERAL COMMODITIES IN 2004

(Kilograms unless otherwise specified)

Commodity		Total	Sources	
			United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural		120,104	78,101	Germany 31,828; Hungary 4,500; Netherlands 4,000.
Carbon black	metric tons	159,592	421	France 39,980; Germany 17,838; Egypt 16,511.
Coal:				
Anthracite	do.	2,198,662	9,022	Russia 671,518; Australia 632,894; South Africa 431,684.
Bituminous	do.	12,863,655	1,419,144	South Africa 4,516,653; Australia 2,629,890; Russia 2,207,361.
Briquets of anthracite and bituminous coal		105,381	--	United Kingdom 104,941; Germany 417; unspecified 23.
Lignite, including briquets		15,454	--	Netherlands 10,187; Sri Lanka 5,062; Turkey 203.
All grades, including briquets	thousand metric tons	24,211	2,007	South Africa 10,194; Indonesia 3,521; Australia 3,263.
Coke and semicoke	do.	170,494	34,699	Russia 58,423; China 30,498; Ukraine 21,972.
Gas, manufactured		513	--	Italy 500; unspecified 13.
Gas, natural:				
Gaseous	metric tons	6,416,472	[1]	Algeria 4,690,518; Norway 1,285,392; Tanzania 425,388.
Liquefied	do.	13,296,771	--	Algeria 5,165,575; Nigeria 3,475,340; Qatar 3,070,458.
Peat, including briquets and litter	do.	189,722	46	Germany 107,285; Estonia 25,838; Latvia 13,859.
Petroleum:				
Crude	do.	59,340,540	--	Mexico 7,881,521; Libya 7,577,060; Russia 7,080,188.
Refinery products:				
Liquefied petroleum gas	do.	1,436,157	--	Algeria 806,814; United Kingdom 158,898; Norway 115,909.
Mineral jelly and wax		42,517,568	100,049	Portugal 11,598,843; China 8,389,945; France 7,485,584.
Asphalt	metric tons	365,196	--	Portugal 138,726; Italy 102,388; France 82,505.
Bitumen and other residues	do.	409,258	[1]	Portugal 138,726; Italy 102,388; France 118,626
Bituminous mixtures		3,567,689	--	Portugal 1,498,000; France 1,211,750; Germany 502,250.
Petroleum coke	thousand metric tons	4,598	3,059	Venezuela 1,016; Aruba 259; United Kingdom 196.

-- Zero.

[1]Less than ½ unit.

Source: United Nations Statistics Division, Commodity Trade Statistics Database (COMTRADE), accessed online at URL http://unstats.un.org/unsd/comtrade.

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THE MINERAL INDUSTRY OF SWEDEN

By Chin S. Kuo

Sweden's economy was export oriented and powered by its industrial production. The output of the mineral and manufacturing industries enabled Sweden to become a leading producing and exporting country in Europe. The gross domestic product (GDP) grew by 2.7% in 2005 compared with 3.7% in 2004. The country has abundant hydropower and timber in addition to a variety of mineral resources, particularly rich iron ore deposits. Sweden produced and exploited base metals, gold, industrial minerals, iron ore, and silver. The mineral industry mined metals and manufactured metal products. Owing to the lack of mineral fuels, the country depended on imports of crude oil to produce petroleum products for its domestic needs. The per capita GDP based on purchasing power parity was $29,898, which was comparable to that of Finland but lower than that of Norway (International Monetary Fund, 2006§[1]).

On July 1, 2005, the Natural Gas Act was replaced by a revised act that implemented the Natural Gas Directive. The directive requires the Government to designate the natural gas transmission and distribution system operators, who must be able to fulfill all the responsibilities of a system operator. Downstream network holders can enter into contracts for third-party access to the transmission and distribution systems. The directive imposes requirements on legal and functional unbundling only for transmission and distribution system operators. Sweden produced no natural gas in 2005 and the Swedish market for natural gas was limited (Claeson and Hagberg, 2005§).

Mawson Resources Ltd. of Canada discovered gold mineralization in outcrop at the Faboliden B prospect, which lies 4 kilometers (km) southwest of the Vargbacken prospect in northern Sweden. Mineralization at Faboliden B was similar in nature to Vargbacken and formed part of the same regional 13-km mineralized trend. Reconnaissance mapping identified quartz-vein-hosted gold mineralization within a metasediment sequence. Faboliden B was drilled in late September 2005 (Mawson Resources Ltd., 2005a).

Mawson Resources also discovered high-grade uranium mineralization at its 10% owned Flistjarn project in Jamtland. Grab and channel samples included values of 19.1%, 13.2%, and 10.4% U_3O_8. Mineralization at Flistjarn was interpreted as vein and unconformity-related and is hosted by a block of Paleozoic sediments thrust over Precambrian volcanics. The company started an application to explore the 200-hectare area for 3 years with the Swedish Mining Inspectorate (Mawson Resources Ltd., 2005b).

Lappland Goldminers AB completed the acquisition of the Knaften gold deposit, which is located south of Lycksele. The Knaften deposit had the largest known gold anomaly in the bottom moraine. In 2005, two reverse-circulation holes that totaled 160 meters (m) were drilled at Knaften toward a gold-mineralized zone north of Oran. Five core-drill holes that totaled 772 m were drilled south of Oran. Weak arsenopyrite mineralization was encountered in quartz diorite but it did not identify the gold mineralization (Lappland Goldminers AB, 2005b).

Lappland Goldminers also worked on the Faboliden mining and concentrating project, which is located 40 km west of Lycksele. A total of 149 core holes that totaled 23,333 m were drilled. Measured mineral resources that contained 21.4 metric tons (t) of gold and indicated resources that contained 14.3 t gold were found down to a depth of 200 m. The company planned to develop an open pit mine and construct a concentrator at Faboliden for the treatment of gold ore. Core drilling continued in 2005. A feasibility study for the project was being carried out by Golder Associates, Outokumpu Technology Oy, and other consultants (Lappland Goldminers AB, 2005a).

Dragon Mining Ltd. inaugurated the Svartliden open pit gold mine, which is located 700 km north of Stockholm in northern Sweden. The ore dressing plant treated 300,000 metric tons per year (t/yr) of ore. The average grade was 5 grams per metric ton (g/t) gold. Dragon Mining had an 80% interest in the project and was the manager. Mineralization at Svartliden remained open along strike to the east and at depth below the planned open pit (Minebox.com, 2005§).

North American Gold drilled its Barsele and Norra deposits in which the company had a 60% interest. A 2,500-m drilling program was underway to expand the gold resource that was previously estimated to be 19,900 kilograms. The company also focused on its Pajala project area, of which the Swedish Geological Survey identified the Stora Sahavaara deposit as having 100 million metric tons (Mt) of magnetite and copper at grades of 44.5% Fe and 0.3% Cu. North American Gold planned to drill 10 large-diameter core holes to confirm the estimates (DesLauriers, 2005§).

Gold-Ore Resources Ltd. of Canada agreed to purchase 100% of the share capital of Bjorkdalsgruvan AB from Minmet plc of Ireland. The assets included the operating mine, plant, reserves/resources, and exploration properties of the Bjorkdal gold mine, which is located 30 km northwest of Skelleftea in northern Sweden. The mine contained measured and indicted reserves of 1.61 Mt at a grade of 1.94 g/t gold. The mine also contained measured and indicted resources of 6.87 Mt at a grade of 1.61 g/t gold and inferred resources of 3 Mt at a grade of 1.71 g/t gold. The plant's capacity was 1.3 million metric tons per year of ore, and gold recoveries were 90% using gravity concentration and a flotation circuit. An extensive regional and local geochemical database was included (CCNMatthews, 2005§).

Lundin Mining Corp. of Canada and ARCON International Resources plc of Ireland intended to merge to create a diversified European base-metals producer with zinc production

[1]References that include a section mark (§) are found in the Internet References Cited section.

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of 152,000 t/yr and lead production of 46,000 t/yr, as well as copper and silver production and a substantial exploration portfolio. Lundin Mining's principal asset was the Zinkgruvan Mine in Sweden. The company held a 74% interest in North Atlantic Natural Resources, which operated the Storliden copper and zinc mine in northern Sweden. Lundin Mining also held a large copper and gold exploration project in the Norbotten mining district in northern Sweden. ARCON's main asset was the Galmoy zinc and lead mine, which is located in Kilkenny County, Ireland (London Stock Exchange, 2005§).

Boliden AB discovered the extensive new Kvarnberget mineralization at Garpenberg, which showed signs of containing high grades of lead, silver, and zinc. Kvarnberget is located not far from Lappberget, which accounted for a significant share of Garpenberg's mining production. A total of 8 holes were drilled towards Kvarnberget, and 6 of them struck the mineralization. The mineralization was a steeply dipping zone that was about 200 m wide (Boliden AB, 2005§).

References Cited

Lappland Goldminers AB, 2005a, First quarter report: Lycksele, Sweden, Lappland Goldminers AB press release, April 29, 6 p.

Lappland Goldminers AB, 2005b, Lappland Goldminers completes acquisition of Knaften gold deposit: Lycksele, Sweden, Lappland Goldminers AB press release, November 16, 1 p.

Mawson Resources Ltd., 2005a, Gold mineralization discovered in outcrop at the Fabodliden B prospect 4 km from Vargbacken: Vancouver, British Columbia, Canada, Mawson Resources Ltd. news release, March 3, 1 p.

Mawson Resources Ltd., 2005b, Mawson discovers high grade uranium mineralization at Flistjarn, Sweden: Vancouver, British Columbia, Canada, Mawson Resources Ltd. news release, December 20, 1 p.

Internet References Cited

Boliden AB, 2005 (December 7), Kvarnberget—New Boliden mineralisation at Garpenberg, accessed December 7, 2005, via URL http://vp031.alertir.com/index.php?p=press&s=detail&afw_id=1027546.

CCNMatthews, 2005 (August 10), Heads of agreement signed to acquire Bjorkdal gold mine, Sweden, accessed August 10, 2005, via URL http://www.ccnmatthews.com/news/releases/show_print.jsp?action=toolbox.

Claeson, Torbjorn, and Hagberg, Maria, 2005 (October 13), Sweden—Implementation of the natural gas directive, accessed October 20, 2005, via URL http://www.mondaq.com/article.asp?articleid=35496.

DesLauriers, Michael J., 2005 (June 20), Emerging junior fires at big Scandinavian targets, accessed June 21, 2005, at URL http://www.resourceinvestor.com/pebble.asp?relid=10678.

International Monetary Fund, 2006 (April), Sweden, World Economic Outlook Database, accessed May 31, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2006/01/data/index.htm.

London Stock Exchange, 2005 (March 3), Regulatory announcement, accessed March 3, 2005, via URL http://www.londonstockexchange.com/LSECWS/IFSPages.

Minebox.com, 2005 (March 22), First gold bar glitters in Svartliden, accessed March 23, 2005, at URL http://www.minebox.com.au/story.asp?articleId=5551.

Major Source of Information

Geological Survey of Sweden
Mineral Resources Information Office
Skolgatan 4
93070 Mala, Sweden

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TABLE I

SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
METALS						
Aluminum, metal:						
Primary		101,800	100,600	101,200	101,400	102,600
Secondary[e]		25,000	28,000	30,000	29,000	30,000
Total		126,800	128,600	131,200	130,400	132,600
Copper:						
Mine output, Cu content		74,269	76,200 r	96,000 r	90,600 r	97,800
Metal:[e]						
Smelter:						
Primary		173,000	188,000	185,000	206,000 r	192,000
Secondary		35,000	35,000	30,000	30,000	30,000
Total		208,000	223,000	215,000	236,000 r	222,000
Refined:						
Primary		179,000	199,000	189,000	210,000	200,000
Secondary		25,000	25,000	25,000	25,000	22,000
Total		204,000	224,000	214,000	235,000	222,000
Gold:						
Mine output, Au content	kilograms	4,986	4,500	4,300	5,200 r	4,400
Metal, primary[e, 2]	do.	8,000	8,000	8,000	8,000	8,000
Iron and steel, metal:						
Iron ore concentrate and pellets:[e]						
Gross weight	thousand metric tons	19,486 r	20,300	21,500	22,300	23,300
Fe content	do.	12,811 r	13,400	14,100	14,700	15,300
Metal:						
Pig iron and sponge iron	do.	3,614	3,703	3,700 e	3,600 e	3,500 e
Ferroalloys:						
Ferrochromium		109,198	118,823	110,529	128,191 r	127,451
Ferrosilicon[e]		22,000	23,000	24,000	24,000	25,000
Total[e]		131,000	142,000	135,000	152,000 r	152,000
Steel, crude	thousand metric tons	5,518	5,754	5,707	5,949	6,000 e
Semimanufactures[e]	do.	4,500	4,600	4,600	4,700	4,700
Lead:						
Mine output, Pb content		85,975	43,000	51,000	54,300 r	58,700
Metal, refined:[e]						
Primary		31,322 r	30,000	24,200	30,200	30,000
Secondary		44,056 r	39,700	52,000	52,000	50,000
Total		75,378 r	69,700	76,200	82,200	80,000
Molybdenum, oxide, roasted, Mo content[e]		3,000	3,000	3,000	3,000	3,000
Nickel, metal, secondary[e]		50	50	50	50	50
Selenium, elemental, refined[e]		20	20	20	20	20
Silver:						
Mine output, Ag content	kilograms	306,029	293,900	306,800	292,600	267,200
Metal, primary[e, 2]	do.	250,000	250,000	250,000	250,000	250,000
Zinc, mine output, Zn content		156,334	148,600	185,900	197,000 r	214,600
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	2,600 r	2,700	2,650	2,700	2,800
Diamond, synthetic[e]	thousand carats	20,000	20,000	20,000	20,000	20,000
Feldspar, salable, crude and ground[e]		40,450 r	40,000	41,000	42,000	43,000
Fertilizer, manufactured:[e]						
Nitrogenous	thousand metric tons	400	400	400	400	400
Phosphatic	do.	10	10	10	10	10
Mixed	do.	300	300	300	300	300
Graphite[e]		963 r	900	850	800	800
Lime[e]	thousand metric tons	550	580	590	590	600
Quartz and quartzite[e]	do.	600	600	600	700	700

See footnotes at end of table.

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TABLE 1--Continued
SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003	2004	2005
INDUSTRIAL MINERALS--Continued:						
Stone:[e]						
Dimension:						
Mostly unfinished	thousand metric tons	160	160	170	160	170
Granite	do.	128 [3]	130	130	130	132
Limestone	do.	28 [3]	30	32	32	32
Slate	do.	16 [3]	15	15	15	16
Other	do.	5 [3]	6	6	6	6
Crushed:						
Dolomite	do.	456 [3]	450	440	430	450
Granite	do.	3,500	3,500	3,500	3,500	3,500
Limestone:						
Chalk	do.	70	70	80	80	80
For cement manufacture	do.	4,070 [3]	4,000	3,950	3,900	4,000
For lime manufacture	do.	900	900	950	950	950
For other construction and industrial uses	do.	1,800	1,700	1,700	1,700	1,800
For agricultural uses	do.	550	600	650	600	650
For other uses	do.	1,500	1,500	1,500	1,500	1,500
Total	do.	8,890 [3]	8,770	8,830	8,730	8,980
Sandstone	do.	5 [3]	10	15	20	20
Undifferentiated	do.	30,000	30,000	30,000	30,000	30,000
Other	do.	371 [3]	400	400	350	350
Sulfur:						
Metallurgy	do.	152	170 [e]	235	235	240
Petroleum	do.	55	60 [e]	57	59	60
Total	do.	207	230 [e]	292	294	300
Talc, soapstone[e]		15,000 [3]	15,000	15,000	14,000	14,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical[e]	thousand metric tons	1,200	1,200	1,250	1,300	1,400
Gas, manufactured:[e]						
Coke oven gas	million cubic meters	500	500	500	500	500
Blast furnace gas	do.	3,500	3,500	3,500	3,500	3,500
Peat:						
Agricultural use[e]	thousand cubic meters	1,400	1,800	1,800	1,100	1,200
Fuel	do.	2,496	2,885	2,633	1,866	1,900
Petroleum, refinery products:[e]						
Liquefied petroleum gas	thousand 42-gallon barrels	3,000	3,000	3,000	3,000	4,000
Naphtha	do.	500	500	500	500	500
Gasoline, motor	do.	40,000	40,000	41,000	41,000	41,000
Jet fuel	do.	1,500	1,500	1,600	1,600	1,600
Kerosene	do.	50	50	50	50	50
Distillate fuel oil	do.	57,000	58,000	58,000	59,000	60,000
Residual fuel oil	do.	39,000	40,000	40,000	41,000	41,000
Other	do.	7,800	7,800	8,000	8,000	8,000
Refinery fuel and losses	do.	5,000	5,000	5,000	5,000	5,000
Total	do.	154,000	156,000	157,000	159,000	161,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised.

[1]Table includes data available through September 13, 2006.

[2]Includes only that recovered from indigenous ores excluding scrap.

[3]Reported figure.

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TABLE 2
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Granges AB (Glencore International AG, 100%)	Sundsvall smelter at Kubikenborg	100
Cement		Cementa AB (Scancem, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden Mineral AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	68
Do.		Outokumpu Oyj	Mines at Pahtohavare	22
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	240
Feldspar		Berglings Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Forshammar Mineral AB (Omya GmbH)	Mines at Limberget and Riddarhyttan	30
Do.		Larsbo Kalk AB (Omya GmbH)	Mines at Glanshamar and Larsbo	20
Ferroalloys		Vargon Alloys AB	Plant at Vargon	175
Gold:				
Ore, gold content	kilograms	International Gold Exploration AB (50%) and Dormant Properties AB (50%)	Bjorkdal Mine at Skellefte	3,000
Do.	do.	Boliden Mineral AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	2,000
Metal	do.	do.	Smelter and refinery at Ronnskar	17,000
Graphite		Woxna Graphite AB (Tricorona Mineral AB, 100%)	Mine and plant at Kringeltjarn, Woxna	20
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Borlange, Lulea, and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (Government, 98%)	Mines at Kiruna and Malmberget	32,500
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, Petiknas, and Renstrom	110
Do.		North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	115
Lime		Euroc Mineral AB	Plants at Limham, Koping, and Storugns	250
Do.		Svenska Mineral AB	Plants at Rattvik and Boda	250
Limestone		Kalproduction Storugns AB (Nordkalk AB, 100%)	Mines at Gotland Island	3,000
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Skandinaviska Raffinaderi AB	Refinery at Lysekil	210,000
Do.		BP Raffinaderi AB	Refinery at Gothenburg	100,000
Do.		Shell Raffinaderi AB	do.	82,000
Do.		AB Nynas Petroleum	Refineries at Gothenburg, Malmo, and Nynashamn	54,000
Silver, metal	kilograms	Boliden Metals AB	Smelter and refinery at Ronnskar	408,000
Do.	do.	North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	25,000
Zinc, ore, zinc content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Zinkgruvan Mining AB (North Ltd., 100%)	Zinkgruvan Mine at Ammeberg	60

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THE MINERAL INDUSTRY OF SWITZERLAND

By Harold R. Newman

The mineral assets of Switzerland are limited. The reserves of the small deposits of metalliferous ores that once existed in Switzerland have mostly been depleted. Metal processing in 2005 was confined mainly to the production of primary and secondary aluminum, copper, pig iron, secondary lead, and steel. Mining was mostly related to industrial mineral commodities required for construction. Commodities produced by mining and processing included cement, clays, gravel, gypsum, and lime (table 1).

Despite a dearth of natural resources, the Swiss economy was among the world's most advanced and prosperous. Trade has been the key to prosperity in Switzerland. The country was dependent upon export markets to generate income and upon imports for raw materials. Swiss companies are extremely competitive in world markets. Switzerland's main trading partners were European Union members; the leading partner was Germany, followed by France, Italy, and the United Kingdom (Swissworld, 2006§[1])

In 2005, the United States and Switzerland signed the U.S.-Switzerland Trade and Investment Cooperation Forum Agreement. This agreement establishes a forum for the United States and Switzerland to discuss bilateral trade and related issues and to examine ways to strengthen their economic relationship. Two-way trade between the United States and Switzerland was $23.7 billion in 2005, of which about 1% was mineral related (Office of the U.S. Trade Representative, 2006§).

The Swiss mineral industry was largely controlled by the Government and was owned privately or by regional governments (table 2). The 26 regional cantons, or communal governments, grant mining and processing licenses and directly operate electricity-generating facilities, gas utilities, local transportation facilities, and water resources. The cantons enjoy a high degree of administrative authority and have their own constitutions and laws. In many areas, the Federal Government simply legislates and supervises while the 26 cantons implement the legislation (U.S. Department of State, 2005§).

Switzerland has a land area of 41,290 square kilometers (15,945 square miles) and had a population of 7.5 million and a workforce of about 4 million in 2005. It is bordered by Austria, France, Germany, Italy, and Liechtenstein (U.S. Central Intelligence Agency, 2006§).

In 2005, the gross domestic product (GDP) based on purchasing power parity was $241 billion, and the per capita income was $33,168. The annual growth rate of the GDP was 1.3% in real terms, and unemployment was 3.7% (International Monetary Fund, 2005§).

During the year, Alcan Aluminium Valais S.A. (part of the Alcan Group of companies) continued production at its aluminum smelter at Steg and its plant at Sierre. Although the plant at Sierre rolled sheets for a variety of applications, its main customer was the automotive market. Alcan announced that, after discussions with a Valais-based consortium, the proposed potential sale transaction for the smelter and plant was uneconomic and would not ensure the facility's future sustainability. Alcan's power contract expired in December 2005, and the company was expected to make a decision in early 2006 on the smelter's future. Regardless of the outcome, the expiration of the contract was expected to have no adverse effect on Alcan's other production activities in the region (Alcan Inc., 2005§).

Schmelzmetall AG continued to produce special forms of hard copper alloys in its vacuum-melting refinery. Schmelzmetall specialized in high-performance beryllium copper alloys. The alloys' special characteristics were their hardness and high thermal and electrical conductivity. Schmelzmetall sold these products under the trademark HOVADUR® (Schmelzmetall AG, 2005§).

Produits Artistiques de Métaux Précieux S.A. (PAMP) operated one of the world's leading and most modern gold refineries at Castel San Pietro. PAMP produced a selection of shapes and sizes of gold bars that ranged from 1 gram to 12.5 kilograms in weight and handled more than 400 metric tons per year (t/yr) of gold material. All the gold material produced could be treated and refined up to the highest grade of 999.9% purity (Produits Artistiques de Métaux Précieux S.A., 2005§).

In 2005, Stahl Gerlafingen AG operated an electric arc furnace at its plant at Gerlafingen. Gerlafingen was a leading supplier of reinforced and industrial steel products in Switzerland. von Moos Stahl AG continued to operate an electric arc furnace at its plant at Emmenbrucke. von Moos was among the leading suppliers of engineering and free-machining steel for the automobile industry and machinery and equipment manufacturers in Switzerland and Western Europe. Both companies based their steel production on recycled scrap metal (Swiss Steel AG, 2005§).

In 2005, salt was produced by one company, Saline de Bex S.A., from its mine at Bex. The company produced salt for the canton of Vaud and, since 2000, for export to Europe and North America (Saline de Bex SA, 2005§).

Almost 80% of Switzerland's energy supply was dependent on imported resources. All fossil and engine fuels were imported, as was nuclear fuel. The electricity industry depends on imports of energy during the winter months, but Switzerland is a net exporter over the full course of the year (Swiss Federal Office of Energy, 2005§).

Petroplus Refining Cressier S.A. was one of Europe's leading midstream oil companies and a major independent tank operator. Midstream is the term used to cover the area of the oil production chain that is focused on refining and storing crude oil and the wholesale marketing of oil products. The refinery is a hydro-skimming visbreaking plant. In the refining process, crude oil is first distilled in a crude distillation unit (CDU). The

[1]References that include a section mark (§) are found in the Internet References Cited section.

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CDU produces a number of basic products: liquefied petroleum gas (LPG), naphtha, kerosene, gas oil, and fuel oil. These basic products are then further processed in upgrading units. The refinery has a reformer unit and an isom unit to turn naphtha into gasoline, a desulfuring unit to process gas oil into low sulfur diesel, and a thermal cracking unit to produce additional gasoline and gas oil from fuel oil. Petroplus supplies 25% of the total Swiss demand for petroleum products (Petroplus Corp., 2005§).

Ascent Resources plc reported that it was awarded two natural gas exploration permits in the canton of Bern. Each of the two permit areas contains gas in wells originally drilled by Elf Aquitaine in 1972 and 1982. At that time, the pipeline network and gas market were both underdeveloped, so Elf did not carry out further exploration. Ascent stated that it would reprocess and interpret seismic data from the area (AFX News Ltd., 2005§).

Switzerland's infrastructure was modern and well developed. The country had a substantial and efficient rail network, an extensive road system (honeycombed with tunnels to cope with the mountainous terrain), two major airports (Geneva and Zurich), and a few smaller airports with international connections. Although landlocked, Switzerland had a state-of-the-art maritime transport network with some 30 ocean-going vessels and river-borne cargo services with connections to the North Sea via barges and tugs on the Rhine River (U.S. Central Intelligence Agency, 2006§).

Outlook

Switzerland's mineral-related assets are limited mainly to basic construction materials, and that is not expected to change. The aluminum smelter at Steg is expected to close. The country serves as a major diamond exchange; it is actively involved in the cutting and polishing of diamond and plays a significant role in international diamond trade activities, although it has no diamond mines. This situation is expected to continue.

Internet References Cited

AFX News Ltd., 2005 (August 23), Ascent Resources wins Swiss exploration permits, accessed August 24, 2005, at URL http://www.rigzone.com/news/article.asp.

Alcan Inc., 2005 (December 13), Alcan and Valais-based consortium end discussions over potential sale of Steg aluminum smelter, accessed February 28, 2006, via URL http://www.alcan.com/web/publishing.nsf.

International Monetary Fund, 2005 (September), Switzerland, World Economic Outlook Database, accessed February 28, 2006, via URL http://www.imf.org/external/pubs/ft/weo/2005/02/data/dbcoutm.cfm.

Office of the U. S. Trade Representative, 2006 (March 25), United States and Switzerland sign "Trade and Investment Cooperation Forum" agreement, accessed June 7, 2006, at URL http://www.ustr.gov.gov/Document_Library/Press_Releases/2006.

Petroplus Corp., 2005, Petroplus refineries, accessed February 28, 2006, at URL http://www.petroplus-international.com/view.do?UID=5f81720f5410ed7150158ad.

Produits Artistiques de Métaux Précieux S.A., 2005, PAMP refining, accessed February 28, 2006, at URL http://www.pamp.com/FA-Refine.html.

Saline de Bex SA, 2005, The company, accessed February 28, 2006, at URL http://www.selbex.com/main.php?id_menu=18id_rubrique=17173&id_object=2642595.

Schmelzmetall AG, 2005, Engineering, accessed June 7, 2006, at URL http://www.schmelzmetall.ch/english/engineering/engineering.html.

Swiss Federal Office of Energy, 2005, International affairs, accessed March 1, 2006, at URL http://www.energie-schweiz.ch/internet/02011/index.html.

Swiss Steel AG, 2005 (March 24), Swiss Steel—A globally active steel group, accessed March 1, 2006, at URL http://www.swiss-steel.com/html/mm_24_03_05_e.htm.

Swissworld, 2006, Economy—Trade, accessed June 7, 2006, at URL http://www.swissworld.org/eng/swissworld.html.

U.S. Central Intelligence Agency, 2006 (January 10), Switzerland, World Factbook 2005, accessed February 28, 2006, at URL http://www.odci.gov/cia/publications/factbook/print.sz.html.

U.S. Department of State, 2005 (July), Switzerland, Background Note, accessed at URL http://www.state.gov/r/pa/ei/bgn/3431.htm.

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TABLE 1
SWITZERLAND: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1,2]

(Thousand metric tons unless otherwise specified)

Commodity[3]		2001	2002	2003	2004	2005
METALS						
Aluminum:						
Primary	metric tons	36,228 [4]	40,007 [4]	43,538 [4]	44,538 [4]	45,000
Secondary	do.	181,700 [4]	181,400 [4]	186,930 [4]	-- [r]	--
Iron and steel, metal:						
Pig iron		100	100	100	100	100
Crude steel		1,048 [4]	1,100	1,100	1,200	1,200
Semimanufactures		700	700	700	700	700
Lead, refined, secondary	metric tons	8,000 [4]	8,000	8,000	9,000	8,000
INDUSTRIAL MINERALS						
Cement, hydraulic		3,920	3,771 [4]	3,700	3,800	3,900
Gypsum		300	300	300	300	300
Lime		60	60	75	75	75
Nitrogen, N content of ammonia		31	33 [4]	29 [4]	32 [4]	30
Salt		400 [r,4]	434 [r,4]	562 [r,4]	569 [r,4]	560
Sulfur, from petroleum refining	metric tons	3,000	3,000	3,000	3,000	3,000
MINERAL FUELS AND RELATED MATERIALS						
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	2,117 [r,2]	2,446 [r,4]	3,640 [r,4]	3,500 [r]	3,500 [r]
Gasoline	do.	9,816 [r,4]	9,928 [r,4]	9,089 [r,4]	10,000 [r]	10,000 [r]
Distillate fuel oil	do.	15,111 [r,4]	15,002 [r,4]	14,126 [r,4]	14,000 [r]	14,000 [r]
Residual fuel oil	do.	3,397 [4]	4,782 [r,4]	4,891 [r,4]	5,000 [r]	5,000 [r]
Bitumen	do.	800	800	800	800	800
Refinery fuel and losses	do.	1,786 [r,4]	1,862 [r,4]	1,716 [r,4]	1,800 [r]	1,800 [r]
Total[5]	do.	33,000	34,820	34,262	35,100 [r]	35,100 [r]

[r]Revised. -- Zero.

[1]Estimated data are rounded to no more than three significant digits.

[2]Table includes data available through March 2006.

[3]In addition to the commodities listed, a variety of crude construction materials (common clay, sand and gravel, and stone) were produced, but output was not reported, and available general information was inadequate to make reliable estimates of output.

[4]Reported figure.

[5]Total of listed products only.

TABLE 2
SWITZERLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Alcan Aluminium Valais SA (Alcan Group, 100%)	Smelter at Stag, rolling mill at Sierre	168
Cement		Holcim (Schweitz) AG (Holcim Group, 100%)	Plants (7) at various locations	4,300
Do.		Cementfabrik Holcim AG (Holcim Group, 100%)	Plant at Rekingen	700
Copper	metric tons	Schmelzmetall AG	Refinery at Gurtnellen	2,400
Gold	do.	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	425
Lead, secondary		Metallum AG	Smelter at Pratteln	13
Petroleum, refinery	barrels per day	Tamoil (Suisse) S.A.	Refinery at Collombey	47,000
Do.	do.	Petroplus Refining Cressier S.A. (The Carlyle Group)	Refinery at Cressier	68,000
Salt		Saline de Bex S.A. (Canton of Vaud, 100%)	Saline plant at Bex	50
Steel		Stahl Gerlafingen AG (Swiss Steel AG, 100%)	Plant at Gerlafingen	650
Do.		von Moss Stahl AG (Swiss Steel AG, 100%)	Plant at Emmenbrucke	300

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THE MINERAL INDUSTRY OF THE UNITED KINGDOM

By Harold R. Newman

The United Kingdom's mineral resources were historically important; however, most of these resources were either exhausted or being produced in small quantities. The country had limited potential for the occurrence of precious and base metals; however, the Scotland region has shown potential to host some small gold and silver deposits. Metal processing remained the basis of an important mineral industry sector and raw materials were imported to satisfy its metallurgical needs. Industrial minerals formed the bulk of raw material production, and the chalk, clay, fluorspar, gypsum, potash, salt, and sand and gravel operations continued in 2005. The United Kingdom was the leading producer of natural gas and petroleum in the European Union (EU).

The United Kingdom, with a population of 60.6 million, had a land area of 244,800 square kilometers (km^2), which includes Rockall and Shetland Islands, and Northern Ireland. In 2005, the gross domestic product (GDP) based on purchasing power parity was $1.8 trillion, and the per capita income, which is based on purchasing power parity, was $30,470. The inflation rate was 2.1% and the unemployment rate was 4.8%, which was one of the lowest in Europe (International Monetary Fund, 2006§[1]).

The United Kingdom joined the EU in 1973, but had not decided at yearend 2005 whether to adopt the European Monetary Union's single currency, the euro (€) (U.S. Central Intelligence Agency, 2006§).

Government Policies and Programs

In 2005, the 1971 Minerals Act, as amended during the years, continued as the statute that governed the development and working of mineral deposits. Minerals are defined in section 209 of the 1971 Act to include all minerals and materials in or under the land of a kind ordinarily worked for removal by underground or surface workings; it does not, however, include peat cut for purposes other than for sale. Mineral development is specifically addressed in the Town and Country Planning (Minerals) Regulations, 1971 and the Town and Country Planning (Minerals) Act, 1981. Mineral rights to mineral fuels, such as coal, petroleum, and uranium, belong to the state. The Coal Authority is authorized to license open pit and underground mines to the private sector subject to restrictions on their size and the payment of a royalty on the amount of coal produced.

Most other mineral rights in Great Britain are privately owned with the exceptions of gold and silver that are vested in the Royal Family. A different situation regarding mineral rights applies to Northern Ireland where, under the Mineral Development Act (Northern Ireland), 1969, the rights to work minerals and to license others to do so are vested in the state.

Environmental Issues

Environmental conditions in the United Kingdom continued to improve with the reduction of carbon dioxide and sulfur dioxide emissions owing to the transition away from coal-fired powerplants and the reduction in the use of coal for residential heating. The Government has ratified the Kyoto Protocol; however, the EU decided to meet its requirements under the Protocol as a whole, rather than as individual signatories, with each member state given a different emissions target by the EU. Under the EU plan, the United Kingdom must reduce its carbon dioxide emissions by 12.5% during the 2008-12 commitment period (U.S. Energy Information Administration, 2006a§).

Production

The Department of Trade and Industry (DTI) continued to ensure a supply of minerals for the country's industry and to oversee mineral activities. The areas of responsibility were all nonfuel minerals, which included all metallic ores and such industrial minerals as barite, china clay (kaolin), fluorspar, high-grade limestone, potash, salt, and silica sand. The industrial minerals sector also included aggregates, brick and brick clay, cement and its raw materials, dimension stone, gypsum for plaster, and sand and gravel used in the construction industry. The DTI was also responsible for mineral fuels, which included coal, natural gas, and petroleum, and for issuing licenses for the exploration, appraisal, and production of natural gas and petroleum. The production of mineral commodities is listed in table 1.

State and privately owned corporations produced minerals and mineral-base products. State ownership was significantly reduced in the mineral industry (table 2).

Trade

In 2005, the United Kingdom was the world's sixth largest economy based on the GDP at purchasing power parity and was a trading nation with a generally free and open market. The country had surplus trade balances in chemicals, metal articles, and mineral products. Total exports were $373 billion and total imports were $448 billion in 2005. Principal export destinations were the United States (14.9%), Germany (10.7%), France (8.7%), Ireland (7.3%), and the Netherlands (5.5%). Principal import sources were Germany, 12.9%; the United States, 8.7%; France, 7.2%; the Netherlands, 6.6%; and China, 4.9% (U.S. Central Intelligence Agency, 2006§).

Commodity Review

Metals

Aluminum.—Four primary aluminum smelters were located in the United Kingdom; three were owned and operated by

[1]References that include a section mark (§) are found in the Internet References Cited section.

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British Alcan Aluminium Ltd. and the fourth smelter was operated by Anglesey Aluminium Ltd. All the aluminum smelters depended on imported alumina for feedstock. There were several small secondary smelters.

Copper.—Alba Mineral Resources plc continued with its verification drilling program on its Arthrath copper-nickel-platinum group project in Aberdeenshire, Scotland. Drilling was focused on the strike length of a 10-kilometer (km)-long east-west-trending mafic intrusion which was up to 600 meters (m) wide in places. Extensive near-surface disseminated magmatic copper-nickel sulfide mineralization was intersected from bedrock with a thickness of 170.3 m with 109.7 m grading 0.29% copper, 0.26% nickel, and 2.3 grams per metric ton (g/t) silver including 7.8 m grading 0.54% copper, 0.51% nickel, and 4.1 g/t silver (Alba Mineral Resources plc, 2005§).

Gold.—Cambridge Mineral Resources plc, Falkland Island Holding plc, and Global Petroleum Ltd. formed the joint-venture Falkland Islands-based company, Falkland Gold and Minerals Ltd. (FGML), through which onshore exploration for gold was performed. FGML held the only license permitting such exploration. Drilling activity began in March 2005 and by the end of September 2005 a total of 6,000 m of core had been drilled testing seven of the originally identified nine targets. Indications of sub-economic gold resources were identified in three intersections, 0.19 g/t gold over 0.75 m; 0.19 g/t gold over 1 m; and 0.18 g/t gold over 1 m. There was one subeconomic intersection of platinum (0.17 g/t), and palladium (0.14 g/t). There was a silver showing of 3.5 g/t over a 1.3-m intersection in a doloritic intrusion. The gold, palladium, and platinum anomalies were associated with carbonaceous shale and mudstones in an area that appeared to be a structurally controlled fault wedge (Falkland Islands Company, The, 2005§).

Tournigan Gold Corp. of Canada was developing its Curraghinalt gold project in Northern Ireland. Infill diamond drilling of the east Curraghinalt vein extension was started.

According to Tournigan, Curraghinalt was a high-grade underground deposit and consisted of a series of subparallel closely spaced mesothermal quartz-sulfide veins localized between a set of east-west striking shear zones. The deposit was estimated to host an inferred resource of 81,000 kilograms of gold grading 15.45 g/t in 527,700 metric tons (t) of ore. The design of the next step of exploration was completed, and Tournigan was anticipating that this phase of exploration would upgrade the existing inferred resource category to measured and indicated categories (Tournigan Gold Corp., 2005§).

Galantas Gold Corp., previously known as European Gold Resources, began the startup for early stage gold production from its Omagh project in County Tyrone, Northern Ireland. Galantas was building Northern Ireland's first gold mine. Production was scheduled for early 2006 and was slated to initially yield about 930 kilograms per year of gold from an open pit operation (Resource Investor, 2005§).

Iron and Steel.—The Corus Group opened a new continuous slab caster at its Port Talbot steelworks in South Wales. The caster increased the plant's annual steel slab output by 25% and gave it the capability to produce about 5 million metric tons per year (Mt/yr). Constructed at a capital cost of £79 million[2] ($146 million), the investment was expected to improve the competitiveness of Corus' carbon steel assets. The investment, part of a wider capital program, was made up of the new continuous caster, improved secondary steelmaking, and increased capacity utilization at Blast Furnace 5. Crude steel production would be focused at three sites instead of five—strip products at Port Talbot, engineering steels at Rotherham, and long products at Scunthorpe (Corus Group, 2005b§).

Corus announced a £130 million ($242 million) major investment at its Scunthorpe steel works. The investment would strengthen Corus' manufacturing capability and competitiveness in rail, structural sections, and wire rod. The investment included installing a new steel casting machine and intermediate rolling mill; establishing a rail production facility to offer longer rail lengths up to 120 m; and developing the rod and section mills to enhance rolling capacity, flexibility, and quality. Scunthorpe was one of its main steelmaking sites (Corus Group, 2005a§).

Platinum-Group Metals.—In 2005, Agricola Resources plc continued with platinum-group metals exploration on its Sandison property, which covers about 8 square miles on the Island of Unst in the Shetland Islands off the coast of Scotland. An extension of geochemical soil sampling was completed, and several strongly anomalous platinum and palladium sites were reported along with minor gold anomalies. Trenching and bedrock sampling studies were continuing in the area, which was located south of Nikka Vord (Agricola Resources plc, 2006§).

Industrial Minerals

Barite.—The United Kingdom remained a major producer and consumer of barite to serve the North Sea drilling industry. The major producer of barite was M-I Drilling Fluids (UK) Ltd., which operated the underground Foss Mine near Aberfeldy in Perthshire and accounted for more than 80% of total production in 2005. The output was mainly used for drilling fluids (British Geological Survey, 2006a).

Cement.—Cement firms won approval to burn alternate fuels at sites in Wales. The Environment Agency granted Castle Cement Ltd.'s Padeswood kiln number 4 a Pollution Prevention and Control permit after 3 years of consultation. Castle replaced its three existing kilns in 2005. Castle would produce 750,000 t/yr by using energy produced from shredded tires; Cemfuel made from solvents, paints, and waste oil; and Profuel made from paper, plastics, and textiles. Lafarge Cement UK started a 9-month trial to burn meat and bone meal at its Aberthaw plant, which would derive 30% of its heat from animal remains (Contract Journal, 2005§).

Lafarge was the United Kingdom's leading cement manufacturer and supplied about 50% of the market. Lafarge faced the prospect of substantial compensation claims after discovering that it had supplied contaminated cement used in houses, roads, and small building projects across southwest

[2]Where necessary, values have been converted from United Kingdom pounds (£) to U.S. dollars ($) at a rate of £1.00=$1.86.

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England that could crumble and crack during the next 15 years as a result of alkali silica reaction. Although none of the buildings were considered at risk of serious structural failure, they may have to be monitored for many years and repairs carried out if necessary. The cost of monitoring and repairs may have to be borne by Lafarge (Business Day, 2005§).

Clay and Shale.—The United Kingdom was a leading world producer and exporter of ball clay. WBB Minerals Ltd. was the country's leading producer of ball clay. Their operations work the ball clay deposits of the Bovey and the Petrockstowe Basins in Devon. The other producer of ball clay was the Imerys Group, which had workings in the Bovey and the Wareham Basins in Dorset. Imerys ceased production in the Petrockstowe Basin at yearend 2004 because of the high costs of extraction (British Geological Survey, 2006c).

The Imerys Group was a leading producer of kaolin (china clay) in the United Kingdom and a major producer worldwide. Imerys' operation of its open pit mines in the St. Austell area in Cornwall accounted for more than 85% of total sales. WBB also produced kaolin from two sites on the Dartmoor granite (British Geological Survey, 2006b).

Fluorspar.—Glebe Mines Ltd. was the only domestic producer of fluorspar (calcium fluorite) and supplied the two United Kingdom fluorochemical producers with acid grade fluorspar. Glebe's operations were based on surface extraction and processing of 250,000 t/yr of mineral bearing ores. The minerals are hosted by Carboniferous limestone in fissure-fill and replacement Mississippi Valley-type deposits ranging in size from 5,000 to 1,000,000 t. Glebe operated the Cavendish Mill near Stoney Middleton for the supply of acid grade fluorspar together with byproduct barite and lead concentrate (Glebe Mines Ltd., 2005§).

Gypsum.—British Gypsum Ltd. (a subsidiary of BPB Industries plc.) was the major producer of gypsum in the United Kingdom. The company had mines in Cumbria, Leicestershire, Nottinghamshire, Staffordshire, and Sussex that produced about 1.5 Mt/yr of gypsum. With few exceptions, this material went to supply the domestic market (British Gypsum Ltd., 2005b§).

British Gypsum announced that it would construct a third plaster manufacturing plant. The £50 million ($93 million) facility would manufacture plaster from natural gypsum rock that is extracted and processed on the site from an existing mine, which would be modernized and reequipped as part of the project. The facility was scheduled to be completed by yearend 2006 (British Gypsum Ltd., 2005a§).

Potash and Salt.—Cleveland Potash Ltd. (CPL), which was the only potash producer in the United Kingdom, operated the Boulby Mine in Yorkshire. The potash ore was a mixture of sodium and potassium chloride crystals with occasional inclusions of insoluble material, usually clays. CPL also mined rock salt as a coproduct from an underlying seam in the Boulby Mine. The potash products were used for fertilizer, as well as for glassmaking and applications in the chemicals and pharmaceutical industries. The salt products met a variety of needs from road maintenance to sugar beet cultivation (Cleveland Potash Ltd., 2005§).

Silica Sand.—WBB Minerals Ltd. was the leading United Kingdom silica sand company and its operations accounted for more than one-half of the market. Their sand quarrying operation was focused on providing a wide range of high purity silica and cristoballite sands for flat and container glass, ceramics, investment casting, and fillers and extenders. WBB also produced silica sands and resin-coated sands for the foundry and the natural gas and petroleum sectors (WBB Minerals Ltd., 2005§).

Mineral Fuels and Other Sources of Energy

Coal.— Most of the coal mining industry was owned by UK Coal plc (formerly RJB Mining plc), which was the leading coal mining company in the United Kingdom and the leading independent coal producer in the EU in terms of production. Of the 17 licenses for underground mining, 7 were held by UK Coal. The 41 surface mine sites were mined by 16 operators. Scottish Coal plc held the largest number of surface mine licenses with 14, all in Scotland. Coal provided about 41% of the country's raw energy needs. This equated to 52 Mt/yr of coal, which made coal the leading fuel source used for power generation. Coal production has been declining steadily for the past 10 years (British Geological Survey, 2006c).

Natural Gas and Petroleum.—The United Kingdom's 23d Oil and Gas Licensing Round (OGLR) led to 99 companies securing a total of 152 production licenses; the highest since the 4th OGLR of 1972. If all offers are accepted, there will be 24 new oil companies participating in exploration and production (Offshore, 2005).

The North Sea holds Europe's largest natural gas and petroleum reserves and was one of the world's key producing regions not in the Organization of the Petroleum Exporting Countries. As of January 2006, the United Kingdom's estimated proven crude oil reserves were 4.0 billion barrels, which was the largest within the EU, and located mostly offshore on the United Kingdom Continental Shelf. Most of the country's production has come from basins east of Scotland in the central North Sea. The northern North Sea, east of the Shetland Islands, also contains considerable reserves, and smaller deposits are located in the North Atlantic Ocean. Besides these offshore assets, the country had the Wytch Farm field, which was the largest onshore oil field in Europe (U.S. Energy Information Administration, 2006b§).

Falkland Oil and Gas Ltd. (FOGL) was an exploration company that was operating in the South and East Falkland Basins. FOGL announced that it was extending the 8,000 km seismic data survey, which commenced in June 2005, by a further 7,000 km. FOGL's objective was to define 20 drillable prospects from the numerous leads that had been identified. Once the 15,000 km survey has been completed, FOGL was intending to carry out a three-dimensional (3D) seismic program in the areas of highest prospectivity (Falkland Oil and Gas Ltd., 2005§).

Renewable Energy.—The Government stated that the United Kingdom had the best wind resource in Europe. The United Kingdom's installed capacity for available onshore wind power energy was 27%, which was greater than Denmark, 20%, and Germany, 15%, where wind farms were widespread. Wind power resource was considered dependable and available

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during peak daytime periods and during winter. Wind power offers a natural source of electricity and reduces the reliance on imported fuels (Alexander's Gas & Oil Connections, 2005§).

SSE Generation [a subsidiary of Scottish and Southern Energy plc (SSE)], and Viking Energy Ltd. signed a memorandum of understanding that was expected to lead to the establishment of a joint venture aimed at developing a wind farm on the Shetland Islands with a capacity of up to 600 megawatts (MW). SSE Generation and Viking Energy had separate proposals for 300-MW wind farms in the central mainland of Shetland. They expected the proposals to be combined and lead to a plan for a single 600-MW wind farm. Shetland was the windiest part of the United Kingdom which was, in turn, the windiest country in Europe. A wind farm on Shetland could be expected to have a load factor of up to 50%, meaning it could produce electricity at close to its maximum capacity for about one-half of the time. That would make it the most productive wind farm in Europe (Scottish and Southern Energy plc, 2005b§).

SSE decided to proceed with the development of Scotland's first conventional large-scale hydroelectric power station in 50 years, following the decision by Scottish Ministers to give consent for the development. The hydroelectric scheme was to be located at Glendoe in the western end of the Monadhliat Mountains. The power station, which will be built underground, would be close to the southeast corner of Loch Ness. With an installed capacity of about 100 MW, Glendoe would be Scotland's second largest conventional hydroelectric station and the first large-scale station to be built since 1957. Glencoe would generate enough electricity to power about 2,500 homes (Scottish and Southern Energy plc, 2005a§).

Work was started in 2005 on the United Kingdom's first major power station fueled on grass. The $12 million bioenergy power station in Staffordshire would run on elephant grass and supply 2,000 homes with electricity. Burning elephant grass would release only the carbon dioxide (CO_2) the plants acquired while they were growing. The plant would operate for 8,000 hours a year on a 24-hour basis and save 1 t of CO_2 per hour, which would have been emitted had fossil fuels been used to generate electricity (Alexander's Gas & Oil Connections, 2005§).

Outlook

The United Kingdom will continue to be a significant player in the world mining and mineral-processing industries, in particular the industrial minerals sector. This is more the result of the extensive range of companies in the country that have various interests in the international mineral industry than of the size of the domestic mineral industry. The major companies are capable of raising investment capital as required. The United Kingdom will continue to be an important political and economic power in Europe.

Exploration for natural gas and petroleum is expected to continue onshore and offshore. Onshore exploration activities will be directed mainly toward gold. Interest in offshore natural gas and petroleum exploration will continue to be focused on North Sea areas, particularly in the areas west of the Shetland Islands, the central North Sea, and the Southern Gas Basin of the North Sea. The possible loss of 50% of coal production could be a major problem that could raise import dependency on coal.

The DTI is expected to continue to be involved in efforts to raise the level of environmental management and to maximize the best use of natural resources, which will include use of recycled materials. Renewable energy sources will continue to be evaluated and developed. Energy produced by wind power and biomass will become more important.

References Cited

British Geological Survey, 2006a, United Kingdom Minerals Yearbook 2005—Barytes: British Geological Survey, June, p. 25.

British Geological Survey, 2006b, United Kingdom Minerals Yearbook 2005—China clay: British Geological Survey, June, p. 30.

British Geological Survey, 2006c, United Kingdom Minerals Yearbook 2005—Coal: British Geological Survey, June, p. 33-37.

Offshore, 2005, UK licensing draws more newcomers: Offshore, v. 65, no. 10, October, p. 14.

Internet References Cited

Agricola Resources plc, 2006 (May 30), 2005 Final results, accessed August 1, 2006, at URL http://www.agricolaresources.com/pressrelease30may.html.

Alba Mineral Resources plc, 2005 (September 30), Drilling results, accessed November 5, 2005, at URL http://www.albamineralresources.com/text/news/releases.pdf.

Alexander's Gas & Oil Connections, 2005 (December 8), UK has best wind resource in Europe, accessed January 13, 2006, at URL http://www.gasandoil.com/goc/news/nte54975.htm.

British Gypsum Ltd., 2005a, British Gypsum to build new UK plaster plant, accessed July 26, 2006, at URL http://www.british-gypsum.bpb.com/immediacy-1648.

British Gypsum Ltd., 2005b, The Group, accessed August 3, 2006, at URL http://www.british-gypsum.com/immediacy-897.

Business Day, 2005 (January 24), Lafarge faces hefty claims for bad cement, accessed September 27, 2005, at URL http://www.bday.co.za/bday/content/direct/1,3523,1794801-6078-0,00.htm.

Cleveland Potash Ltd., 2005, About Cleveland Potash, accessed August 3, 2006, at URL http://www.iclferetilizers.com/irj/servlet/prt/prtroot/com.sap.

Contract Journal, 2005 (January 13), Cement firms energy boost, accessed September 27, 2005, at URL http://www.contractjournal.com/home/default.asp.

Corus Group, 2005a (February 17), Corus announces major investment at Scunthorpe steelworks, accessed May 1, 2006, at URL http://www.corusgroup.com/en/news/news/2005/2005_scunthorpe_steelworks.html.

Corus Group, 2005b (May 4), Corus completes major investment at Port Talbot, accessed May 5, 2006, at URL http://www.corusgroup.com/en/news/2005/2005 _port_talbot_ investment.html.

Falkland Islands Company, The, 2005, Gold and Minerals, accessed July 31, 2006, at URL http://www.the-falkland-islands-co.com/mineral exploration/?section=5.asp.

Falkland Oil and Gas Ltd., 2005 (September 9), Extension of 2D seismic program, accessed August 7, 2006, at URL http://www.fogl.com/pdfs/extension_of_seismic_sept_2005.pdf.

Glebe Mines Ltd., 2005, Extraction, accessed August 1, 2006, at URL http://www.glebemines.com/extraction.htm.

International Monetary Fund, 2006 (April), United Kingdom, World Economic Outlook Database, accessed July 28, 2006, at URL http://www.imf.org/external/pubs.ft/weo/2006/01/data/dbcoutm.cfm.

Resource Investor, 2005 (September 26), Galantas Gold targeting near term production in Northern Ireland, accessed July 31, 2006, at URL http://www.resourceinvestor.com/pebble.asp?relid=13151.

Scottish and Southern Energy plc, 2005a, Development of Scotland's first large scale hydroelectric plant for 50 years, accessed August 9, 2006, at URL http://www.scotish-southern.co.uk/SSEinternet/index.aspx?id=920.

Digitized by Google

Scottish and Southern Energy plc, 2005b, SSE Generation and Viking Energy Ltd. plan for 600 MW wind farm, accessed August 9, 2006, at URL http://www.scotish-southern.co.uk/SSEinternet/index.aspx?id=898.
Tournigan Gold Corp., 2005, Tournigan re-starts exploration drilling at Curraghinalt, accessed July 31, 2006, at URL http://www.tournigan.com/s/home.asp.
U.S. Central Intelligence Agency, 2006 (July 20), United Kingdom, World Fact Book 2006, accessed July 28, 2006, at URL http://www.cia.gov/publications/factbook/geos/uk.html.
U.S. Energy Information Administration, 2006a (April), United Kingdom, Country Analysis Brief—Environment, accessed July 28, 2006, at URL http://www.eia.doe.gov/cabs/ United_Kingdom/Enviroment.html.
U.S. Energy Information Administration, 2006b (May), United Kingdom, Country Analysis Brief—Oil, accessed August 3, 2006, at URL http://www.eia.doe.gov/emeu/cabs/United_Kingdom/Oil.html.
WBB Minerals Ltd., 2005, Quarry operations, accessed August 3, 2006, at URL http://www.wbbminerals.net/about/group/wbb_minerals_uk.html.

Major Sources of Information

British Geological Survey
Keyworth, Nottingham NG1 25GG
United Kingdom

Central Statistics Office
Great George St.
London SW1 P3AQ
United Kingdom

Department of Economic Development (Northern Ireland)
Belfast BT1 3AJ
Northern Ireland

Department of the Environment
Minerals Division
2 Marsham St.
London SW1 P3EB
United Kingdom

Department of Trade and Industry
123 Victoria St.
London SW1E 6RB
United Kingdom

Geological Survey of Northern Ireland
20 College Gardens
Belfast BT9 6BS
Northern Ireland

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TABLE 1

UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003[e]	2004[e]	2005[e]
METALS						
Aluminum:						
Alumina from imported bauxite		83,900	73,800	72,000	72,000	72,000
Metal:						
Primary		340,778	344,318	342,748 [2]	359,631 [2]	368,477 [2]
Secondary		248,600	204,900	205,400 [2]	205,400 [2]	205,301 [2]
Total		589,378	549,218	548,148 [2]	565,031 [2]	573,778 [2]
Cadmium, metal, including secondary		425	292	22 [2]	--	--
Iron and steel:						
Iron ore and concentrate, manganiferous:						
Gross weight		510	464	500	500	500
Fe content, 54% Fe		281	255	275	275	275
Metal:						
Pig iron	thousand metric tons	9,861	8,579	10,228 [r, 2]	10,180 [r, 2]	10,500
Steel:						
Crude	do.	13,610	11,718	12,900	13,766 [2]	13,210 [2]
Hot-rolled	do.	11,369	13,771	13,500	13,500	13,500
Lead:						
Mine output, Pb content[e]		800	700	700	1,044 [r, 2]	1,044 [p]
Metal:						
Smelter:						
Bullion from imported concentrate		36,000	36,000	9,000	36,000 [r]	36,000
Secondary, refined[e, 3]		100,000	100,000	100,000	120,000	120,000
Total		136,000	136,000	109,000	156,000 [r]	156,000
Refined:						
Primary[4]		202,915	207,719	181,668 [2]	225,000 [r]	125,900 [2]
Secondary[3]		163,390	166,927	169,574 [2]	50,000 [r]	120,000
Total		366,305	374,646	351,242 [2]	275,000 [r]	245,900 [2]
Nickel, metal, refined[5]		33,817	33,790	26,788 [2]	38,606 [r, 2]	37,127 [2]
Zinc, metal, smelter		100,000	99,600	16,600 [2]	--	--
INDUSTRIAL MINERALS						
Barite[e, 6]		66,000	59,000	57,000	61,000 [r]	60,000
Bromine[e]		27,900 [r, 2]	24,500	25,000	1,000 [r]	--
Cement, hydraulic	thousand metric tons	11,854	11,089	11,215 [2]	11,405 [2]	11,216 [2]
Clays:[e]						
Fire clay	do.	600	491	528 [r, 2]	600 [r]	600
Fuller's earth[7]	do.	52	44 [2]	34	19 [r]	11 [2]
Kaolin, china clay[8]	do.	2,204 [2]	2,163 [2]	2,097 [2]	1,995 [r, 2]	2,148 [2]
Ball clay and pottery clay[7]	do.	998	921 [2]	885 [2]	965 [r]	900
Other, including shale	do.	10,100	10,306 [2]	10,400	10,500	10,500
Feldspar, china stone		2,995	1,896	2,097 [r, 2]	1,995 [r, 2]	2,000
Fluorspar, all grades[e, 9]		50,000	53,000	56,000	55,000	52,000
Gypsum and anhydrite[e]	thousand metric tons	1,600	1,700	1,700	1,600	1,686 [2]
Lime, hydrated and quicklime[e]	do.	2,000	1,500	1,500	1,500	1,500
Nitrogen, N content of ammonia	do.	850	837	1,044 [2]	1,071 [2]	1,080
Potash, K_2O equivalent		531,900	540,100	621,400 [2]	375,000 [r]	341,000 [2]
Salt:[e]						
Rock	thousand metric tons	1,900	1,500	1,500	1,500	1,500
From brine	do.	1,200	1,000	1,000	1,000	1,000
In brine, sold or used as such	do.	3,000	3,200	3,200	3,200	3,200
Sand and gravel:						
Common sand and gravel	do.	101,397	94,424	91,000	90,000	90,000
Industrial sand	do.	4,100 [e]	3,833	4,073 [r, 2]	4,000	4,000
Sodium compounds, n.e.s., carbonate[e]	do.	1,000	1,000	1,000	1,000	1,000

See footnotes at end of table.

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TABLE 1--Continued

UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2001	2002	2003[e]	2004[e]	2005[e]
INDUSTRIAL MINERALS--Continued						
Stone:						
Crushed:						
Calcite[e]	thousand metric tons	12	10	10	10	10
Chalk[e]	do.	10,000	8,587 [2]	8,066 [r, 2]	8,000 [r]	8,000
Dolomite[e]	do.	14,000	12,937 [2]	12,167 [r, 2]	13,000	13,000
Igneous rock	do.	53,190	51,008	51,356 [r, 2]	52,000 [r]	52,000
Limestone[e]	do.	83,492 [r, 2]	83,492 [r, 2]	88,013 [r, 2]	86,846 [r, 2]	87,000
Sandstone	do.	19,967	18,362	11,665 [r, 2]	11,929 [r, 2]	12,000
Slate, including fill	do.	467	622	900	900	900
Total	do.	181,128 [r]	175,018 [r]	172,000 [r]	173,000 [r]	173,000
Dimension:[e]						
Igneous	do.	51,501 [r, 2]	51,225 [r, 2]	51,356 [r, 2]	52,000 [r]	52,000
Limestone	do.	250	217 [2]	225	250	250
Sandstone	do.	250	250	250	250	250
Slate	do.	551 [r, 2]	742 [r, 2]	832 [r, 2]	901 [r, 2]	900
Total	do.	52,600 [r]	52,400 [r]	52,700 [r]	53,400 [r]	53,400
Sulfur, byproduct:[e]						
Of metallurgy		69,000 [2]	33,000 [2]	13,000	15,000	15,000
Of petroleum refining		111,000	125,000	115,000	120,000	120,000
Total		180,000	158,000	128,000	135,000	135,000
Talc, soapstone, pyrophyllite		4,937	6,194	6,000	6,000	4,000
Titania[e, 10]		200	200	200	200	200
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite		616	2,000 [e]	1,500	1,200	600
Bituminous, including slurries, fines, and so forth		31,512	28,000	26,258 [r, 2]	23,335 [r, 2]	20,000
Total		32,128	30,000 [e]	27,758 [r, 2]	24,535 [r, 2]	20,600 [2]
Coke:						
Metallurgical		5,306	4,335	4,286 [2]	4,300	4,300
Breeze, all types		210	221	314 [2]	300	300
Fuel briquets, all grades		550	431	393 [2]	400	400
Gas, natural:						
Marketable[11]	million cubic meters	112,768 [r]	109,050	108,091 [r, 2]	100,969 [r, 2]	92,620 [2]
Marketed[e, 12]	do.	70,000	70,000	70,000	70,000	70,000
Natural gas liquids[e, 13]	thousand 42-gallon barrels	62,000	62,000	60,000	60,000	60,000
Peat[e]	cubic meters	1,000	973 [2]	2,008 [r, 2]	1,262 [r, 2]	1,000
Petroleum:						
Crude[14]	thousand 42-gallon barrels	821,220	810,158	733,763 [r, 2]	715,304 [r, 2]	700,000
Refinery products:[e]						
Liquefied petroleum gas	do.	21,937 [r, 2]	24,963 [2]	26,828 [r, 2]	25,000	25,000
Naphtha, including white spirit	do.	26,000 [r, e]	27,480 [2]	28,000	28,000	28,000
Gasoline	do.	181,296 [r, 2]	198,458 [2]	191,187 [r, 2]	200,000	200,000
Jet fuel and kerosene	do.	70,445 [r, 2]	71,952 [2]	69,314 [r, 2]	72,000	72,000
Distillate fuel oil	do.	199,911 [r, 2]	210,536 [2]	206,919 [r, 2]	200,000	200,000
Residual fuel oil	do.	76,832 [r, 2]	57,768 [2]	74,278 [r, 2]	58,000	58,000
Lubricants	do.	6,500	6,500	6,500	6,500	6,500
Bitumen	do.	10,000	10,000	10,000	10,000	10,000
Petroleum coke	do.	5,000	5,000	5,000	5,000	5,000
Petroleum wax	do.	400	400	400	400	400
Unspecified	do.	30,000	30,000	30,000	30,000	30,000
Refinery fuel and losses	do.	37,522 [r, 2]	40,625 [r, 2]	31,755 [r, 2]	30,000 [r, e]	30,000
Total	do.	666,000 [r]	684,000 [r]	680,000 [r]	665,000 [r]	665,000

See footnotes at end of table.

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TABLE 1--Continued

UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. [r]Revised. -- Zero.

[1]Table includes data available through February 2007.

[2]Reported figure.

[3]Includes a small quantity of primary lead from domestic concentrate.

[4]Produced entirely from imported bullion and includes the lead content of alloys.

[5]Refined nickel and nickel content of ferronickel.

[6]Includes witherite.

[7]Salable product.

[8]Sales, dry weight.

[9]Proportions of grades not available; probably about two-thirds acid grade.

[10]Sales.

[11]Methane, excluding gas flared or reinjected.

[12]Marketable methane, excluding that used for drilling, production, and pumping operations.

[13]Includes ethane, propane, butane, and condensates, respectively.

[14]Excludes gases and condensates.

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TABLE 2
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		Alcan Inc.	Burntisland, Scotland (closed)	100,000
Aluminum:				
Primary		British Alcan Aluminium Ltd.	Fort William, Kinlochleven, and Lynemouth	196
Do.		Anglesy Aluminium Ltd. (Rio Tinto Corp., 51%, and Kaiser Aluminum and Chemical Corp., 49%)	Holyhead, Wales	113
Secondary		Bernhard Metals Ltd.	Derby	50
Do.		Calder Industries Ltd.	do.	35
Do.		Deeside Aluminium Ltd.	Clwyd, Wales	55
Do.		Hydro Aluminium Alupres Ltd.	Caerphilly, Wales	38
Barite		Laporte Industries plc	Mines in Derbyshire	25
Do.		M-I Drilling Fluids (UK) Ltd.	Aberfeldy	50
Celestite		Bristol Minerals Co. Ltd.	Yate, Avon	30
Cement		Aberthaw and Bristol Channel Portland Cement Co. Ltd.	East Aberthaw and Rhoose, Glamorgan, Scotland	1,000
Do.		Lafarge Cement UK (Lafarge Group)	Plants at Aberthaw, Cauldon, Dunbar, Hope, Masons, Northfleet, Plymstock, and Weardale	7,300
Do.		Castle Cement Ltd. (Heidelberg Cement AG, 100%)	Plants at Ketton, Ribblesdale, Padeswood, and Pitstone	3,400
Do.		Rugby Group	Plants at Barrington, Chinnor, Rochester, Rugby, and South Ferriby	2,700
Clay:				
Ball clay		WBB Minerals (SCR Sibelco NV)	Various operations in northern and southern Devon	500
Do.		Imerys Group	Opertions in Bovey and Wareham Basins, Dors	300
China clay (kaolin)		do.	Mines and plants in Cornwall and Devon	3,000
Do.		WBB Minerals (SCR Sibelco NV)	Mines and plants in Cornwall	1,000
Coal	million metric tons	UK Coal plc	19 mines in various locations	30
Copper		IMI Refiners Ltd.	Refinery at Walsall, west Midlands	80
Ferroalloys		Corus Group	Teesside, Cleveland	80
Do.		Murex Ltd.	Rainham, Essex	25
Do.		London and Scandinavian Metallurgical Co. Ltd.	Rotherham, South Yorkshire	30
Do.		Eastlink Ferroalloys Ltd.	Glossop	1
Fluorspar		Glebe Mines Ltd.	Mill at Stoney Middleton, mines in Derbyshire	250
Gypsum		British Gypsum Ltd.	Mines in Cumbria, Nottinghamshire, and Sussex	3,500
Lead:				
Primary		Britannia Refined Metals Ltd. (MIM Holdings Ltd.)	Northfleet, Kent	225
Secondary		do.	do.	50
Do.		H.J. Enthoven and Son Ltd. [Billiton (U.K.) Ltd., 100%]	Darley Dale, Derbyshire	60
Lead, smelter		MIM Holdings (U.K) Ltd.	Avonmouth, Avon	55
Natural gas	billion cubic feet per year	Amoco Ltd., British Petroleum Ltd., Esso (U.K.) Ltd., Phillips Petroleum Co. plc, Shell (U.K.) Ltd.	North Sea gasfields	1,250

See footnotes at end of table.

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TABLE 2--Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nickel, refined	INCO Europe Ltd. (INCO Ltd., Canada)	Clydach, Wales	30
Nitrogen, N content of ammonia	Terra Nitrogen Ltd.	Billingham	550
Petroleum:			
Crude million 42-gallon barrels per day	Amoco Ltd., British Petroleum Ltd., Chevron Ltd., Esso (U.K.) Ltd., Occidental Petroleum Co. Ltd., Shell (U.K.) Ltd., Texaco Ltd., Unocal, Inc.	North Sea oilfields	2
Refined do.	British Petroleum Ltd., Conoco Ltd., Mobil Oil Co. Ltd., and others	11 refineries in various locations	2
Platinum-group metals	Johnson Matthey plc	Refineries at Enfield (London) and Royston	20
Potash	Cleveland Potash Ltd. (Israel Chemicals Ltd., 100%)	Boulby Mine, Yorkshire	1,000
Salt:			
Road	do.	do.	600
Rock	British Salt Ltd.	Middlewich	800
Do.	Irish Salt Mining and Exploration Co.	Mine at Carrick Fergus, Northern Ireland	300
Sand and gravel	TMC Pioneer Aggregates Ltd.	Chelmsford, Essex	1,000
Silica sand	WBB Minerals (SCR Sibelco NV)	Various operations in Chesire, Humberside, and Norfolk	5,000
Slate, natural	Alfred McAlpine Slate Ltd.	Penrhyn quarry, Bethesda, Wales	25
Steel	Corus Group plc	4 steelworks in Gwent, Humberside, Lanark, and Scunthorpe	18,000
Do.	ASW Holdings plc	Integrated steelworks at Cardiff, Wales	600
Stone, crushed	ARC Ltd. (Hanson plc, 100%)	50 quarries in various locations	50,000
Do.	do.	Glensanda quarry at Oban, Scotland	15,000
Talc	Alex Sandison and Son Ltd.	Unst, Shetland Islands	15
Do.	Shetland Talc Ltd. (Anglo European Minerals Ltd., 50%, and Dalriada Mineral Ventures Ltd., 50%)	Cunningsburg, Shetland Islands	35
Tin, ore	Baseresult Holdings Ltd.	South Crofty Mine, Cornwall (closed March 1998)	1,800
Titanium, sponge	Deeside Titanium Ltd.	Plant at Deeside, Clyde	5
Zinc, smelter	Britannia Zinc Ltd. (Xstrata plc, 100%)	Avonmouth, Avon (closed 2003)	120

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